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New LCDs and CRTs Compete for Top Honors, page 56

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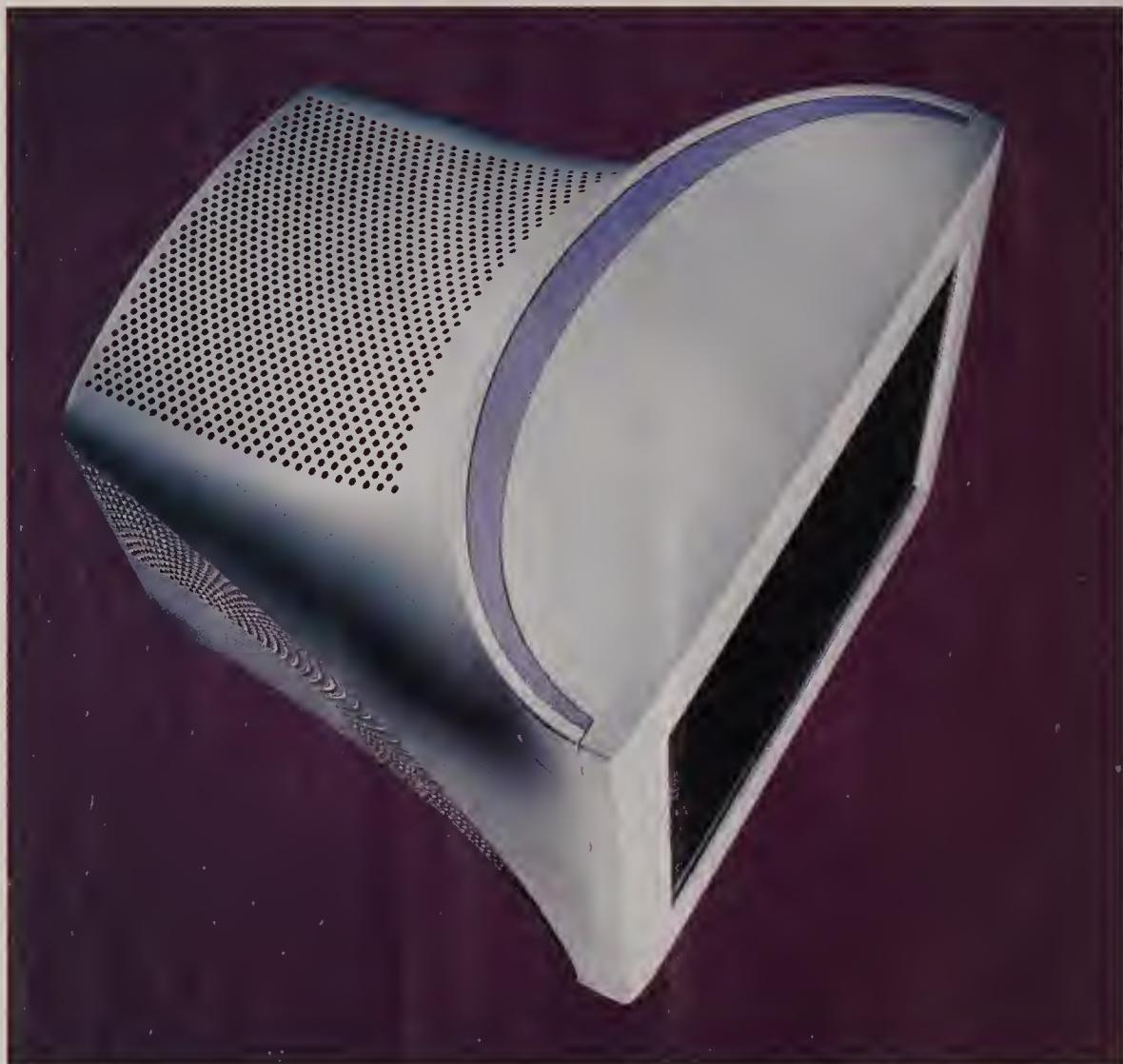
CHRISTOPHER BREEN Get help with monitor connectors, hard-to-read keyboards, adding laser printers to AirPort networks, and performing a custom installation with Software Restore discs.

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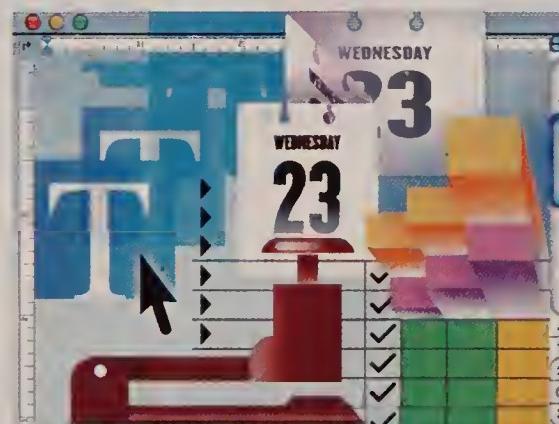
Incorporating MacUser



Macworld's Ultimate Buyers' Guide: Monitors

DAVID MORGENSTERN AND JONATHAN SEFF Without a monitor, a computer is useless, and since your monitor will likely outlive your current Mac, it's important to make the right purchase. In this buyers' guide, we help you decide between CRT and LCD technology, and we review 37 displays of different shapes and sizes.

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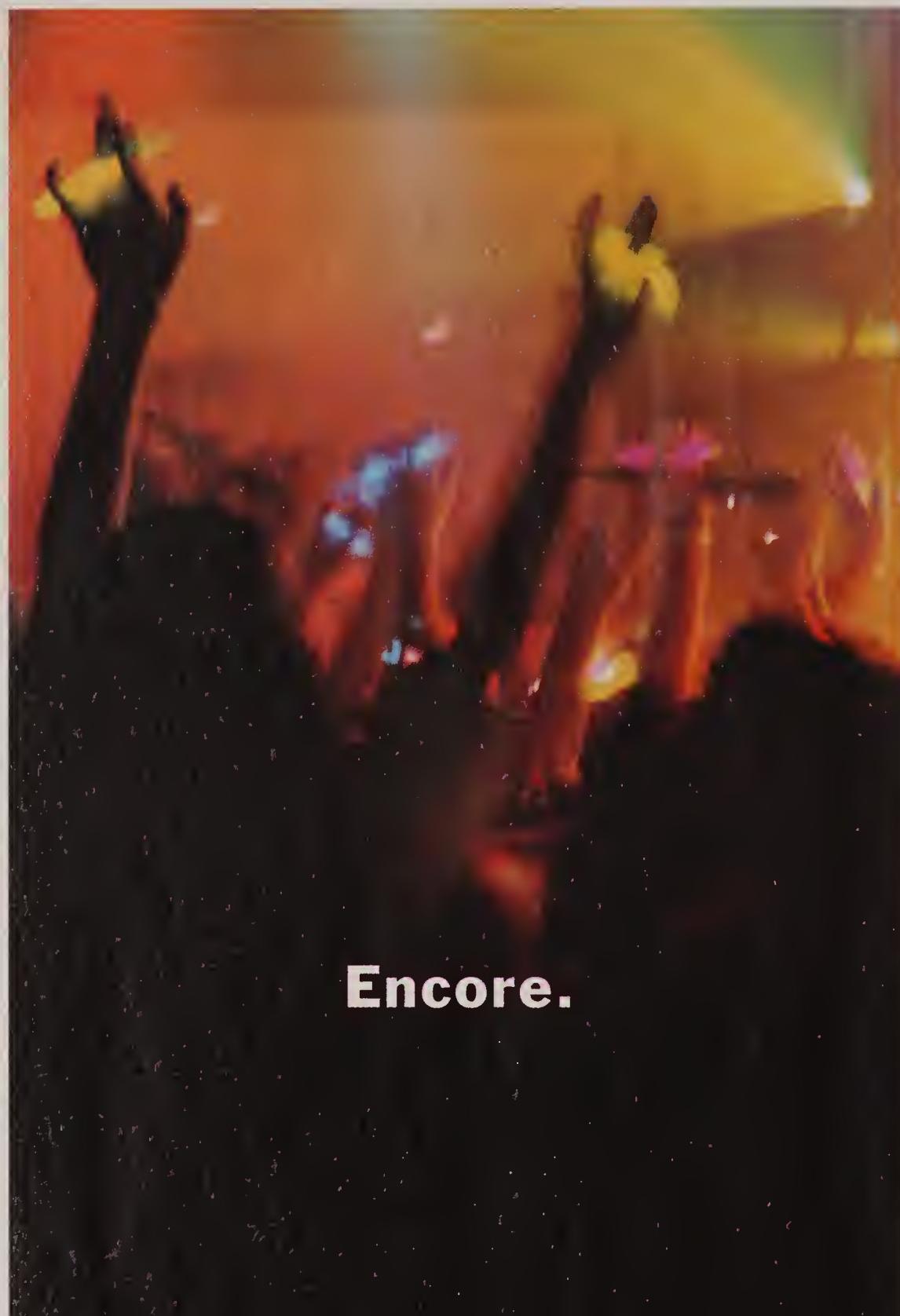
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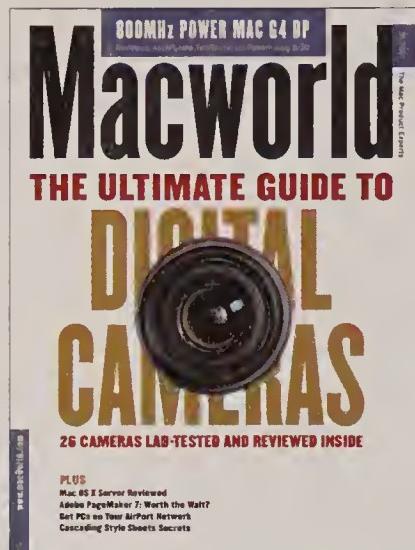
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Forums and Feedback



Sense and Sensibility

It's fitting that our in-depth reviews of 26 digital cameras made so many readers look at the big picture. The November 2001 issue touched off debate on everything from the future of digital imaging to when we can expect Macs to obey voice commands. Some readers made a stink

about a few reviews, but that didn't faze us—we're always willing to listen to reason. So enjoy this taste of recent comments. And we're sure this issue will inspire an equally passionate response; we have a sixth sense about these things. **m**

Candid Camera Comments

TOM WHITELEY The statement "Conventional wisdom in the camera industry is that 35mm film can render an image in around six million pixels" is just plain wrong ("Macworld's Ultimate Buyers' Guide: Digital Cameras," November 2001). By most measures, silver-halide film yields significantly more comparative pixels than this. A \$10 to \$15 single-use camera yields a color negative with significantly more information than a \$7,000 six-megapixel digital camera. Digital photography is much, much less cost effective and convenient than silver-based photography. Point-and-shoot film cameras are very reliable and are found in most homes today. Film is inexpensive and totally reliable. The resulting negatives, which few actually keep, are not subject to the unknown stability of digital media and the great problem of future changes in standards.

KEN ZIRKEL You didn't quite identify the consumer audience to whom digital photography offers the greatest appeal. Advanced amateurs are the ones to gain the most from the digital revolution. If you're someone who photographs all the family events, gives framed photos as gifts, enters photo contests, and takes your photography seriously, you're going to love the digital workflow.

M. E. BAER One of the reasons I've decided not to go digital is that ink used in most printers will fade after a relatively short period of time. To me, going with prints developed at my local drugstore is a better bet. Photographic prints will last longer than ink-jet reproductions.

We tackled the issue of long-lasting prints in "Macworld's Ultimate Buyers' Guide: Printers" (August 2001). While the longevity of ink-jet prints used to be a serious concern for photographers, printer makers

have made great strides in creating long-lived inks. If you print your images on suitable paper and handle them with care, digital images printed with today's long-lasting inks should have a life span similar to that of prints from film cameras.—Ed.

A Dim Outlook

GLENN CORWIN While I agree that Outlook 2001 is dramatically better than its previous incarnation (*Reviews*, November 2001), it still doesn't provide feature parity with the Windows version. I'm one of the few Mac-only developers at my company. All the Windows developers track bugs using fancy forms within Outlook. It's too bad that these forms aren't supported on the Macintosh.

DENNIS MCELROY It's great to finally be able to use my Mac for scheduling, e-mail, and the like, at work. The one limitation I've experienced concerns using Outlook over a wireless network. Although the PC client works just fine, I've consistently seen the Mac version time-out when sending any e-mail message longer than a paragraph or with attachments of any size. I can only hope Microsoft comes up with an answer, since wireless is taking the country by storm.

Time to Speak Up

DR. BYRON DE LONG Thank you, Andy Ihnatko, for your heretical observation that, as interfaces go, point and click is passé ("Voice of Reason," November 2001). While others at *Macworld* have extolled the promise of voice recognition for both dictation and navigation, you are the only one who has taken the proper editorial tone of irritation, irreverence, and indignation, in reporting on your

Radio Shack research. There is no excuse for this lack of innovation, Apple. If your people could design a GUI to run on 64K of RAM in 1984, then there's no reason, other than lack of vision, that they can't create useful and reliable voice navigation today on what your marketing division tells us is the world's first desktop supercomputer. Having to touch a computer to operate it is absurd, and the people who figure this out at the OS level are going to change everything.

A Left-Handed Compliment?

DALE MCGRAW Your review of monochrome handhelds (November 2001) states: "The m500 has a leather cover that folds back, and you can attach it to either side of the PDA . . . making the m500 friendly to lefties." I own the m500, and the leather case will fit only the unit's left-side slot. Consequently, the stylus will fit only in its right-side slot. I'm sure that the leather cover can slide into the right-side slot—that is, if you want it sliding out and falling to the ground every time the unit is turned upside down. If you want the cover on the right side, you'll have to carry the stylus in your pocket, because the left-side slot is too small to hold the stylus.

Routed

NEIL LEE The wireless broadband routers review (November 2001) was definitely not up to your usual standard. I have an SMC Barricade, which comes with a print server (a fact that wasn't mentioned) and has 128-bit WEP with a firmware upgrade that's months old. You could have mentioned that all of these routers were upgradeable with firmware updates, to let your readers know that this additional functionality exists. And how did your reviewers miss the printer port in the back of the Barricade?

Brought to You by Aqua

DAN CIPOLLA I'm upset that I haven't seen any publicity for Mac OS X. Every time I turn on the TV, I see an ad for Windows XP. When I turn

on the radio, I hear an ad for XP. Why isn't Apple advertising? How can it hope to succeed without promoting itself? Gateway advertises how great and friendly its stores are. Apple has stores, but they're not advertised, so a large portion of the American public doesn't know about them.

Panoramic Views

RON STEWART I didn't think that anyone else knew about Panorama (*Reviews*, November 2001). I'm a network administrator, and I love Panorama's speedy style. The small manufacturing company where I work has grown from two Macs to 20, and it uses Panorama for mailing-list, order, and parts-orders databases, along with Everywhere's SQL server. I'd recommend ProVue's Panorama to any company using Macs.

STEVEN H. BLACKWELL (FILE-MAKER SOLUTIONS ALLIANCE PARTNER)

Your conclusions about Panorama as compared to FileMaker Pro seem to be utterly insupportable. FileMaker Pro is fully multiuser. In conjunction with FileMaker Server, it can support as many as 250 simultaneous users. It also serves files to the Web, faithfully rendering most complex layout elements to browsers supporting Cascading Style Sheets and rendering more-generic layouts to older browsers. It has been cross-platform for many years; it currently runs on the classic Mac OS, Mac OS X, and Windows. I don't understand how your reviewer could come to the conclusion that FileMaker Pro had been "blown out of the water" by this product.

KEVIN MALLON (PUBLIC RELATIONS MANAGER, FILEMAKER)

You state that "Panorama has always blown away competing products, such as FileMaker Pro and 4D, in the performance department," but you fail to support this claim by not providing benchmark-testing comparisons. Making unsupported claims such as this blurs the line between editorial opinion and factually responsible reviews.

I did test FileMaker (with a large RAM partition) and Panorama by

performing some common real-world tasks, using a data set of 122,000 records. Panorama 4.0 substantially outperformed FileMaker Pro 5.5 in each test; in some tests, Panorama was more than 10 times faster. Given the review's length, I felt it was sufficient to note that Panorama has historically been faster than its competition, and that it continues to be so today.—Geoff Duncan.

Prepare for a Sleepless Night

M. WROE When you give a product a score of 4.5 mice, which part of the mouse constitutes the 0.5? My friend and I have come up with the head and tail ends, half if you cut it down the middle, or sections if you quarter or otherwise dice it. I feel I will lose sleep over this if it is not answered.

Crossing Over

GARY DEPP Thanks for "Make AirPort Cross Platforms" (*How-to*, November 2001). I had an AirPort network running in my home, but I was using a dial-up connection on my lone Compaq. Because of your article—and a modest investment in a Lucent/Orinoco Silver USB client receiver—the PC now gets high-speed access, too. It was every bit as simple as you stated.

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CORRECTIONS

A MultiMediaCard is not compatible with a Secure Digital card ("Macworld's Ultimate Buyers' Guide: Digital Cameras," November 2001). Also, the Kodak DC4800 Zoom comes with a lens cap, and the Olympus Camedia C-2100 UltraZoom comes with a 2.7x digital zoom and a CRT viewfinder.

The phone number for Miramar Systems ("Make AirPort Cross Platforms," *How-to*, November 2001) is 800/862-2526.

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FutureWire

LATEST VERSION OF FIREWIRE STANDARD TO BOOST SPEEDS, CONNECTIVITY

Any glimpse into Apple's future will likely reveal a FireWire cable. Whether at the center of the company's digital-hub strategy or in the latest digital-video hardware, the FireWire connectivity standard has never been more integral to the modern Macintosh.

But the standard that Apple developed for high-speed peripherals hasn't been refined for years. The same can't be said for the rival Universal Serial Bus standard. Intel launched the faster USB 2.0 specification more than a year ago (see *News*, August 2000); devices using the new specification have been available since fall 2001.

The current FireWire standard can handle data at a maximum transfer rate of 400 Mbps. USB 2.0 beats that with 480 Mbps—a massive jump from USB 1.1's transfer rate of 12 Mbps. You used to be able to pigeon-hole USB 1.1 as the low-bandwidth peripheral interface and FireWire as its high-bandwidth counterpart, but now many observers see USB 2.0 as competing directly with FireWire.

Adding Fuel to the Fire

So how will FireWire keep the fire stoked? By topping USB 2.0's speed. The 1394 Trade Association—named after the IEEE 1394 specification trademarked by Apple as FireWire—has announced a next-generation FireWire specification called 1394b. It will boost FireWire's sustained data-transfer rate to 800 Mbps and



faster, reaching 3,200 Mbps at high-end implementation.

The 1394b specification should be finalized by the time you read this. It has passed two IEEE ballots; it awaits only formalization and a few minor revisions to the connector design.

The 1394b specification can be used with Cat 5 (Ethernet) cable, Plastic Optical Fiber (POF) cable, and 50-micron Multimode Fiber (MMF) glass cable. The optical cables permit high data-transfer speeds over distances of up to 100 meters.

The automotive industry likes POF for 1394b cabling because it's light and inexpensive and presents no fire risk in an accident. For data transfer at the highest speeds for the longest distances, MMF cable must be used. Professionals in audio and video studios are keenly interested in switching to 1394b over MMF, because one such connection has the potential to replace dozens of traditional copper cables. (Copper can manage the highest speeds, but only at distances of up to 4.5 meters.)

Most consumers won't have to worry about optical cables, but they will need to negotiate connectors. The new connectors and cables for 1394b have been designed with ease of use as a primary concern.

While 1394a (the current FireWire standard) and 1394b specifications are compatible, 1394b requires different hardware to run at higher speeds. So 1394b devices need to be identifiable, and one way to recognize them is by the connectors.

Currently, a four-pin small connector and a six-pin large connector are used for all FireWire devices. But 1394b adds two more—a beta connector and a bilingual connector, both rectangular, measuring 8mm wide by 5mm high.

The beta connector will connect only 1394b devices to other 1394b

devices. It's keyed so that it will fit into only beta or bilingual sockets. The bilingual connector can link 1394b devices with 1394a devices; it can also connect two 1394b devices. The bilingual connector is keyed so that it will fit a bilingual socket but not a beta socket.

Does it seem confusing? Don't worry. The 1394 Trade Association offers this simple maxim: "If you can plug it in without breaking anything, it will work." Even though the keying system is difficult to describe in words, it's designed for easy interoperability in practice.

Rivals or Partners?

So how will the faster FireWire standard affect its rivalry with USB? At any speed, FireWire offers distinctive advantages: letting devices communicate without a computer, protection of intellectual property, and guaranteed bandwidth for streaming data. These features make FireWire an

attractive technology for consumer electronics, digital video, and professional video and audio production. Without significant modifications, USB won't make inroads into these areas.

On the other hand, USB 2.0 offers speed at a low price. For most devices that people connect directly to their computers—digital cameras, printers, and MP3 players—USB 2.0 will more than carry the load. More important, none of these devices take advantage of the intelligence that FireWire offers. And USB 2.0 is fully backward compatible with USB 1.1, without the need for any new connectors.

Both USB and FireWire bring unique features to the Mac, so it's best to view them not as competing but as complementary standards. Each has strengths, and products will be based on FireWire or USB depending on their requirements—not on the marketing spin.—DAVID READ

X TAKES EFFECT

If Mac OS X is to become the default platform for Mac users, the software that people use daily needs to appear in OS X-native form. For people who work with digital video, that includes applications for editing video and creating visual effects and graphics.

Adobe has solved one part of that equation with the release of After Effects 5.5. The newest version of the 3-D-compositing application supports Mac OS X 10.1; the updated software also runs on Mac OS 9.1 and higher. And while OS X compatibility represents a major addition to After Effects, it's not the only new feature.

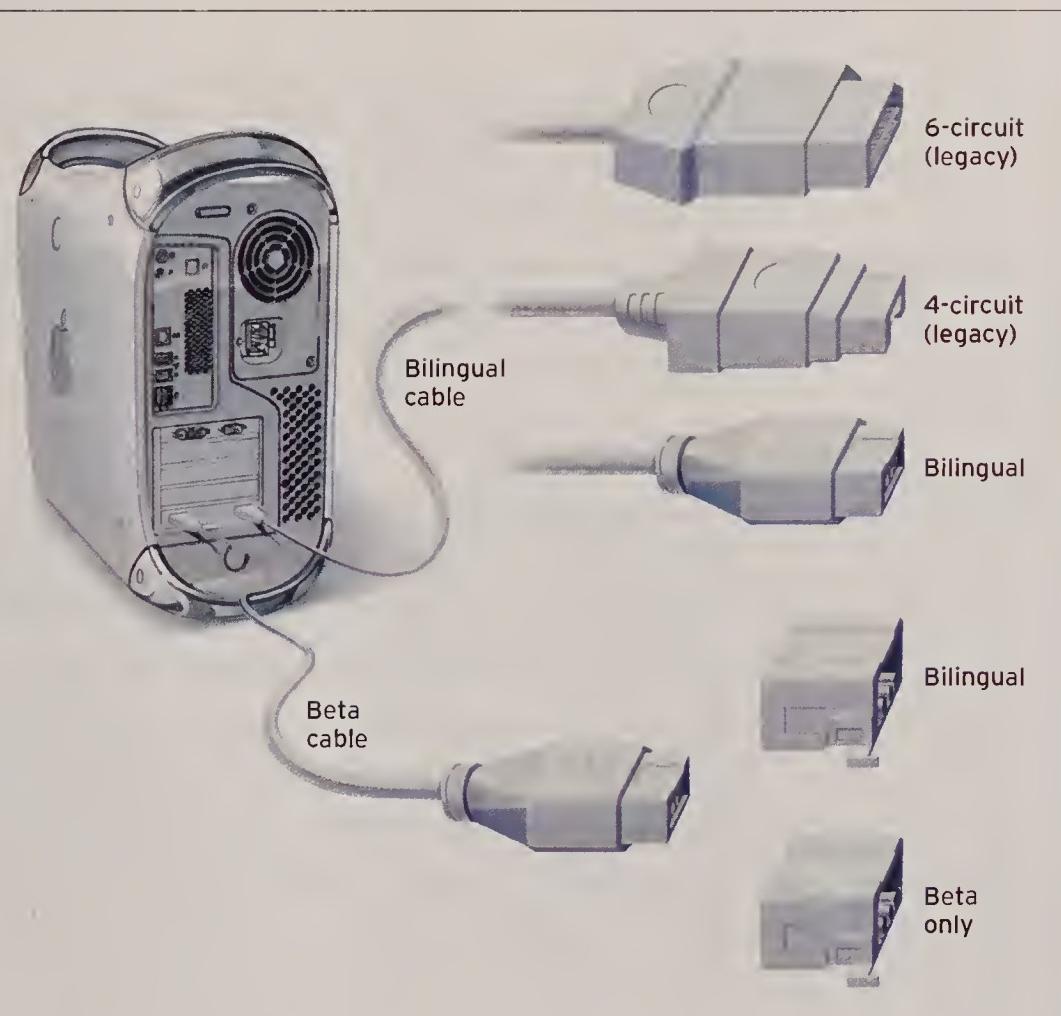
The Light Transmission feature lets layers cast colored shadows, giving users more control over composition illumination. The Advanced 3-D Renderer properly antialiases intersecting layers, improving the compositing quality. Users now have access to multiple, simultaneous 2-D and 3-D views of compositions. Also included are several new effects—such as levels controls, four-color gradients, and cell patterns—and an improved Effects palette for managing them. In addition to the SWF and RPF formats, After Effects 5.5 can import MPEG-1 files—previously a Windows-only feature.

After Effects 5.5 Standard sells for \$649. The \$1,499 Production Bundle offers additional effects such as color stabilization and Advanced Lightning, import of Maya 3-D camera data, the Smart Mask Interpolation Keyframe Assistant, and the Zaxwerks 3-D Invigorator Classic plug-in.

A remaining piece of the OS X puzzle for video professionals is Premiere, Adobe's popular DV-editing program. Adobe confirms that it will run natively on OS X but hasn't said when it will do so.—JONATHAN SEFF

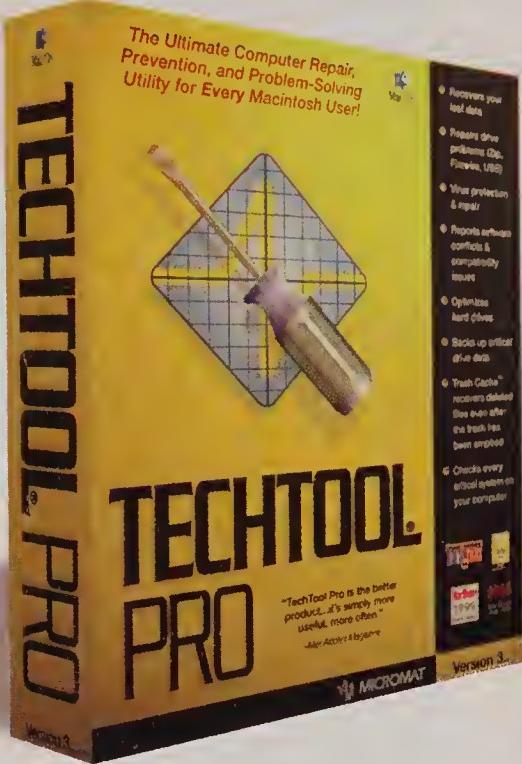
More Info: www.macworld.com/2001/04/27/nab4.html

Mac users may still be waiting for an OS X-native version of Premiere, but Adobe offered a glimpse of what to expect at last year's NAB show.



Cable Ready? FireWire devices for the current standard sport 4-pin or 6-pin connectors. The 1394b standard introduces two new connectors—bilingual, which can connect to the 6-pin and 4-pin sockets on older FireWire devices as well as to newer peripherals, and beta, which can connect only to the sockets of newer devices. Apple has yet to announce whether it will adopt 1394b.

In with the new...



In with the newer...



TechTool Pro 3 is the super utility for your Macintosh. Besides repairing and recovering data, TechTool Pro can help you circumvent problems in the first place. Our new virus detect and repair feature, as well as our software conflict check feature, lets you keep your computer in tip-top shape. When booted from the included emergency CD, you can even check, repair and optimize your OS X computer.

Every day, more and more Macintosh professionals are choosing TechTool over other system utilities. In fact, even Apple Computer includes TechTool Deluxe with every copy of their AppleCare™ Protection Plan. Simply put, TechTool Pro 3 is the most complete and powerful troubleshooting utility available for your computer. Why would you settle for anything less?

For Apple's next-generation operating system, you'll need a next-generation disk utility. That's why Micromat has introduced Drive 10, the first and final disk utility for Mac OS X. Problems with your drive? Drive 10 can repair almost any drive problem with one simple click of your mouse. All within OS X's native environment.

While Drive 10 is a new product, it is derived from TechTool Pro, Micromat's world-class diagnostic and repair utility. Using TechTool's time-tested routines as well as some new routines developed exclusively for OS X, Drive 10 offers many tools for checking and repairing any drive on your system. Don't entrust your OS X drive to ancient utilities. Protect your data and drive safely with Drive 10.

 Micromat Inc.

800-829-6227

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Three for the Show

TRIO OF FEATURES IS THE HIGHLIGHT OF FINAL CUT PRO UPDATE

With Apple's newly released Final Cut Pro 3 (800/692-7753, www.apple.com), professional video editors will be able to store more footage, perform sophisticated color corrections, and use real-time effects, without needing anything more than the program and a FireWire-enabled G4 Mac.

The latest version of the digital-video-editing application also runs natively in Mac OS X, providing pro users with what Apple hopes will be another reason to switch to the next-generation operating system.

Real Time, Real Advantages

Final Cut Pro 3, which also runs in Mac OS 9.2.2, takes advantage of the Velocity Engine technology built into the G4 processor to deliver dual-stream real-time effects, such as cross-dissolves, titles, and color correction. Real-time effects were part of Final

Cut Pro's architecture in previous versions, but they were usable only with additional third-party hardware such as the \$999 Matrox RTMac. Now, all you need is a Mac with a G4 processor and FireWire support.

Real-time software acceleration also enables the new color correction tools in Final Cut. These tools, which include primary and secondary color correctors, range checking, zebra-stripe overlays, and waveform and vectorscope monitors, allow users to fix color problems and apply corrected settings to clips.

The other key addition to Final Cut is OfflineRT, a format based on the new QuickTime Photo-JPEG codec. With OfflineRT, users can transcode DV, SD, or HD footage in the Photo JPEG format in real time, for time-code-accurate, low-resolution offline work. The DV format normally lets you store 5 minutes of video per

gigabyte of hard-drive space; Photo-JPEG provides 40 minutes of video per gigabyte. That makes it possible to edit clips offline—on an airplane, with a PowerBook G4, for example—using a fraction of the hard-drive space required for DV.

Coming Attractions

Final Cut Pro 3, which should be shipping by the time you read this, costs \$999; registered users of Final Cut Pro can upgrade for \$299. You'll need a Mac with a 500MHz G4 processor or better to use the G4 real-time effects, and a PowerBook with a 667MHz G4 to use mobile real-time DV effects. At December 2001's DV Expo trade show in Los Angeles, Apple not only unveiled the Final Cut Pro update but also previewed the upcoming Mac OS X version of DVD Studio Pro, which is expected to ship in the first three months of 2002.—JONATHAN SEFF

ACRONYM SOUP

ADobe TRIES TO SIMPLIFY PUBLISHING TASKS WITH XMP

As cross-platform publishing continues to accommodate new methods of file delivery, two electronic asset-management issues loom before those who create publishable files—cataloging metadata and then accessing that descriptive information through multiple applications.

Adobe has one answer to both problems: XMP, or Extensible Metadata Platform. The XMP technology is based on Extensible Markup Language, or XML—the lingua franca for defining other, more specific markup languages—which is nonproprietary; data captured in XML can usually be read by any application that parses the markup language.

"Metadata provides insight into what an asset—an object with intrinsic value, like an image or a document—contains,

without having to open the file," says Andrew Salop, a senior product manager at Adobe.

Adobe sees XMP as a way to attach metadata to files without forcing print and design professionals to break a sweat. To promote XMP, Adobe is making a file-information interface available in its applications. Users fill in certain data fields, such as author and keyword. That information will then be associated with the file via XMP. With XMP, Adobe wants users to catalog metadata as they create files, instead of after. And XMP bundles that information within the file rather than storing it in a third-party database.

XMP's information options are based on the Dublin Core, a metadata set that describes document properties, such as creator and description. Like XML, the Dublin Core is publicly available, making data recognizable across platforms and applications.

Adobe has already incorporated XMP into Acrobat 5, Illustrator 10, and the forthcoming InDesign 2. It plans to eventually build XMP into all of its applications.—LISA SCHMEISER

NAILING A NEW LOOK

Q&A with TRENT REZNOR

Trent Reznor ushered in a new era of digital audio production with the 1989 release of *Pretty Hate Machine*, an album that helped launch an entirely new genre of music. Throughout the 1990s, Reznor's band, Nine Inch Nails, continued to break new sonic ground and push the limits of what could be done with music on a computer. And he's still breaking ground, with the December 2001 release of the *Nine Inch Nails* tour film *And All That Could Have Been* and its accompanying CD. Reznor and *Nine Inch Nails* Webmaster Rob Sheridan shot the entire film on MiniDV, edited the video in Final Cut Pro, mixed the audio in Digidesign Pro Tools, and assembled the DVD rough cut in DVD Studio Pro.—MATTHEW HONAN

Q: Why did you decide to shoot *And All That Could Have Been* on MiniDV?

Reznor: Costwise, it made sense. We bought a few [Canon] XL1 cameras, and we could film every night of the tour from eight different positions. It seemed like it was something we could manage and

make it what we wanted it to be.

From our perspective, we weren't video editors. The cool thing about this process was finding out that, yeah, you can do this. The ease of use of the hardware and software made it possible to get the tedious crap out of the way and just

get down to what we wanted to do.

Q: What did you use to edit footage?

Sheridan: When the tour was over, the whole thing was edited in Final Cut from beginning to end. We had something like 200 MiniDV tapes. We lined up all that footage and all the different takes of one song

in Final Cut. So we would have professionally recorded audio synced up to 30 different instances of a song, like five angles from Chicago and three from San Diego.

Q: How was using DVD Studio Pro?

Reznor: It had literally just come out, and it was timely because we had fig-

AT A GLANCE

TRENT REZNOR

AGE: 36

RESIDENCE: New Orleans, LA

MACS: Power Mac G4/867 with 1GB of RAM, PowerBook G3/500

SOFTWARE: Propellerhead Software Reason, Mark of the Unicorn Digital Performer, Digidesign Pro-Tools, Native Instruments Absynth

ured out digital-video editing, and we wanted to [figure out] what we could do [with] DVD. We had a very rudimentary knowledge of what you can do. DVD Studio Pro, we used with the intention of mocking up something. We knew we were taking it to an authoring place, and we could beta test it at home. This was a way for us to get a feel for things in very easy-to-deal-with terms. It puts a lot of power in something that doesn't have a thick manual. **Q:** Didn't you record *Pretty Hate Machine* on a Mac? **Reznor:** I've had a Mac since the very first one. I was also using a Commodore 64 for MIDI. At the time of *Pretty Hate Machine*, I had a Mac Plus. I did all the sequencing of that record on that. With *Broken*, Studio Vision had come out. That was the first marriage of MIDI and digital audio, and that forever changed the way I record. Now that it's gone from recording everything on tape with a few things on the computer to recording everything on the computer, it's changed the roles of a lot of people in the studio. The programmer is much more the engineer now. All the engineers now have to know Pro Tools.

More Info: www.macworld.com/2002/02/macbeat/reznor.html

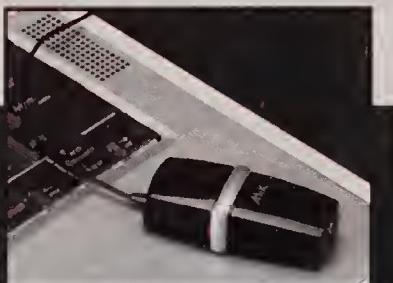
Trent Reznor describes the role of Macs in his recording studio.



GEEK STUFF

The Whole Mouse in Your Hand

The TrackPad on Apple's PowerBook and iBook models gives mobile Mac users a handy way to operate their laptop. But it doesn't give them multiple programmable buttons—the TrackPad has the same single-button clicker you'll find on other Apple-made mice. Power users who want the one-two punch of multiple buttons—or folks who simply can't stand the TrackPad—can choose from among a mess of mice, but only if they're willing to lug that peripheral around with their laptop whenever they hit the road. For users who put as high a premium on portability as on programmability, there's the Super Mini Optical Mouse from Atek Electronics (888/889-9990, www.atek.com). Just an inch wide and 2.5 inches long—smaller than even Macally's pint-size iOptiJr—the Atek mouse can rest comfortably on your index and middle fingers. More important, the \$50 Super Mini Optical Mouse fits right on your PowerBook's palm rest, perfect for those cramped cross-country flights. Travelers will also enjoy the convenience of the miniature travel pouch that comes with the mouse. The three-foot-long cord plugs into your Mac's USB port, and downloadable driver software lets you program the right and left buttons. One drawback: the driver software works only on Mac OS 8 and 9. Mac OS X users can operate the mouse, but if they want something they can program, they'll just have to reconcile themselves to living large.—PHILIP MICHAELS



A New AirPort Opens

With recent updates to AirPort software and hardware, Apple (800/692-7753, www.apple.com) has added some much-missed features to its wireless Ethernet products. But in some ways, AirPort 2.0 is more of a teaser for cool stuff yet to come.

Apple says that it had three main goals with AirPort 2.0: to increase compatibility, to redesign the Base Station, and to improve security. Apple also wanted to get existing users up-to-speed—all the new client-side benefits are available even to older AirPort cards, though only new Base Stations can take advantage of most of AirPort 2.0's features. The exception is AirPort's newfound compatibility with America Online. Before, AOL users had to use a separate ISP when connecting to the Internet through their Base Stations. Now they can connect to AOL directly—even with existing hardware.

The new Base Station, which is iBook-white instead of silver, has been beefed up considerably to support as many as 50 Network Address Translation (NAT) users, up from 10 to 20. It also has two Ethernet ports—a 10-Mbps port for your broadband connection and a 100-Mbps connection for your LAN—and a built-in firewall. The most important thing about the new Base Station, however, may be its expandability. Apple has hinted at future software upgrades that will add new features, something that the older hardware apparently made more difficult to achieve.

On the security front, Apple seems to have taken note of all the security problems in 802.11b,

the technical standard underlying AirPort products. Wired Equivalent Privacy (WEP) has proven to be the security equivalent of snake oil. It left AirPort users stuck with 40-bit encryption keys. New Base Stations support 128-bit keys. While 128-bit WEP may be simply a higher grade of snake oil, enabling longer keys on the client side is an important step since this format has become a standard for many corporate and university environments. The AirPort 2.0 client software also supports Cisco's LEAP (Lightweight Extensible Authentication Protocol) security scheme, which improves wireless security considerably. Unfortunately, LEAP requires Cisco-made base stations, so AirPort Base Station owners don't get the security benefits.—STEPHAN SOMOGYI



HARDWARE

DIGITAL CAMERAS

- A 4.13-megapixel camera from Ricoh (888/742-6410, www.ricohzone.com): The **Caplio RR1** (\$699) offers 2,272-by-1,704-dpi resolution and a 3x optical zoom. It comes with 8MB of on-board memory and a 64MB Smart-Media card, and it features three operating modes.

PRINTERS

- Two ink-jet printers from Hewlett-Packard (800/752-0900, www.hp.com): The **HP Photosmart 1215** (\$299) and **HP Photosmart 1315** (\$399) offer 2,400-by-1,200-dpi resolution. The 1215 prints 15 black-and-white pages per minute and 3.1 color pages per minute. The 1315 prints 17 black-and-white pages per minute and 13 color pages per minute. It also has a 2.5-inch color display.

STORAGE DEVICES

- An external FireWire drive from Maxtor (800/262-9867, www.maxtor.com): The **80GB Personal Storage 3000DV** (\$350) is an 80GB hard drive with a 7,200-rpm mechanism. Its storage capacity is 33 percent more than that of previous 3000DV external drives.

- Two drives from QPS (800/559-4777, www.qps-inc.com): The **120GB Que M3 Ultra Slim Hard Drive** (\$499) is an external FireWire drive that runs at 7,200 rpm. The **32x Que CD-RW Drive** (USB 2.0 version, \$299; FireWire version, \$249) features 32x CD-R burning, 10x CD-RW rewriting, and 40x CD-ROM reading speeds. It includes

BurnProof technology to prevent buffer underruns.

VIDEO PRODUCTION

- Pinnacle Systems' video-editing system (650/526-1600, www.pinnaclesys.com): The **CinéWave RT** (\$9,995; upgrade, \$2,495) lets users perform real-time editing, effects processing, and compositing on their Macs, using uncompressed standard-definition video. The CinéWave hardware-software system combines the Targa Ciné Engine with Final Cut Pro, Commotion Pro, Knoll Light Factor, and CinéWave RT software.



SOFTWARE

AUDIO SOFTWARE

- **Peak DV 3.0**, from Bias (800/775-2427, www.bias-inc.com): The digital-audio editor, which runs on both OS 9 and OS X, was previously available only to Final Cut Pro users (\$199; upgrade, free).

CROSS-PLATFORM SOFTWARE

- **Virtual PC 5.0**, from Connectix (800/950-5880, www.connectix.com): The updated application runs on both OS 9 and OS X. It includes support for Windows XP and for DVD-ROM data, as well as Virtual Switch networking for increased networking capabilities. The Windows 98 and DOS versions of Virtual PC 5.0 are already shipping. Versions with Windows 2000 and Windows XP Home preinstalled will ship in late December and early January.



What's HOT

A QUICK LOOK AT THE WORLD OF TECH

1. Lawyers and consumer groups criticize the proposed settlement to the Microsoft antitrust case. *Bill Gates disagrees, noting that mounting legal fees have forced him to light victory cigars with \$20 bills instead of the customary c-note.*
2. Thousands of Mac users descend upon San Francisco for Macworld Conference & Expo. *Attendees include Mac enthusiasts, software developers, and confused moviegoers who thought they were in line for the Harry Potter matinee.*
3. Could a new design for the iMac be in the works? *We're not sure, but Steve Jobs was spotted pricing colored translucent plastic at a Home Depot a couple of weeks ago.*

January, respectively
(Virtual PC with Windows
98, \$199; Virtual PC with
DOS, \$99; upgrade, \$79).

● **Revolution 1.1**, from Runtime Revolution ([44] 131 718 4333, www.runrev.com): The tool for cross-platform application development now runs natively on OS X. It features cross-platform access to ODBC, Oracle, and MySQL databases, plus extended support for Internet protocols (Standard edition, \$349; Professional edition, \$995).

GAMES

● **Harry Potter and the Sorcerer's Stone**, from Aspyr Media (888/212-7797, www.aspyr.com): The 3-D-action game based on the movie runs on both OS 9 and OS X (\$30).

PRODUCTIVITY SOFTWARE

● **ViaVoice for Mac OS X**, from IBM (888/746-7426, www.ibm.com): The speech-recognition software now runs natively on OS X. It adds an expanded vocabulary, faster training, and G4 optimization (\$171; upgrade, \$20 for Via Voice for Mac Enhanced Edition users).

● **iListen 1.1**, from Mac-Speech (603/644-7253, www.macspeech.com):

This update to the speech-recognition program, which runs on OS 9, adds a One Shot Command feature and support for non-English languages. It also features new ways to enhance user speech files (\$99; upgrade, free).

● **OpenOSX Office 1.0**, from OpenOSX (760/935-4736, www.openosx.com): The open-source productivity suite offers OS X-native versions of word processor AbiWord and spreadsheet application Gnumeric, as well as graphics editor Gimp (\$30, \$50 with Gimp; upgrade, \$10).

SCIENCE SOFTWARE

● **Mathematica for OS X**, from Wolfram Research (800/965-3726, www.wolfram.com): The mathematics and calculation software now runs on OS X, offering speed and stability enhancements (commercial license, \$1,495; upgrade from 4.1, \$45 if purchased before March 23, 2001, or free if purchased after; upgrade from 4.0 and earlier, \$375).

TAX-PREPARATION SOFTWARE

● **TaxCut Deluxe**, from H&R Block (800/472-5625, www.taxcut.com): The software runs on OS 8.6 and later, including OS X. A Tax Law Assistant tool keeps users apprised of how tax-law changes affect them. Auto-entry lets users import W-2 and 1099 data electronically. Ten new state editions are now available, bringing the total number of states covered by TaxCut to 36 (\$25; online version, \$20 for federal, \$10 for state).

● **Quicken Turbo Tax Deluxe**, from Intuit (800/952-2558, www.turbotax.com): The updated program reflects the new tax laws. A Tax Law Advisor feature offers personalized advice on the changing laws. The Automated Tax Return feature now lets users import 1098 data. More financial institutions and payroll processors have signed up with Intuit to make W-2 and 1099 data available for download (\$50; online version, \$20 to \$30).—Compiled by PHILIP MICHAELS

MAC OS X UPDATES

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Aladdin StuffIt Deluxe 6.5.1

Adds StuffIt Contextual Menu for OS X

Aladdin StuffIt Expander 6.5.1

Adds automatic file transfer to Palm upon synchronization

Arkaos VJ 2.1.2

Multimedia authoring tool

AtWork 2.2

Cocoa-based time-billing application

Blizzard Starcraft X 1.0

Multiplayer action game

CE QuickMailPro 3.0

Client component for e-mail system

Clipboard Manager 1.0

Tool to create multiple clipboards

CustomGrid 2.2

RealBasic plug-in for spreadsheet-grid control

Epson Stylus Photo 820 1.1aS

Printer driver

Extensis Suitcase 10.0.1

OS X version of font-management application

Graphisoft ArchiCAD 7.0v2

Architectural-design software adds OS X 10.1 support

HP LaserJet driver 101001.00

Printer driver for many HP models

ICQ 2.8a32

Instant-messaging, SMS, and chat client now stores contact list on the server

iView Media Pro 1.3

Improves PDF support for asset-management application

Lexmark Z22/Z32 Color Jetprinter 2.0.3

Printer driver

Now Up-to-Date & Contact 4.1

Updates version 4.0 of the calendar and contact manager to run on OS X

ProSQL 1.0

Database-management and reporting tool

SparkME 2.1

Audio-editing and processing application

Symantec Norton AntiVirus X 8.0b16

Beta of virus-protection utility

Tri-Backup 3.03

Automatic backup and synchronization utility

Memory Monitor 1.1

Displays memory-usage graph in the Dock

Vving 1.0

Network-performance diagnostic tool

Wacom Tablet 4.71-8

Driver for all Wacom USB tablets

WebEvent Publish 2.0

Web-based event-publishing application

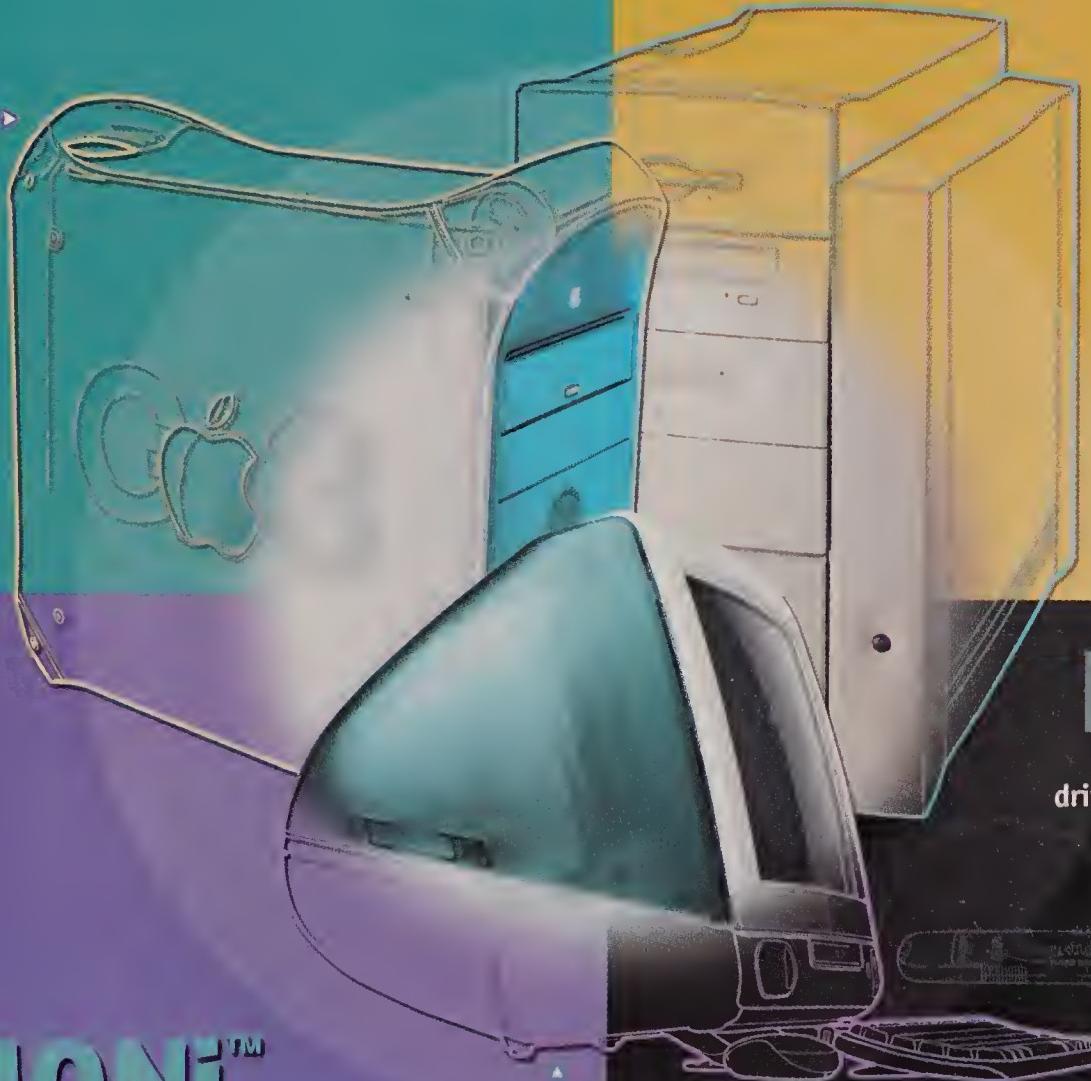
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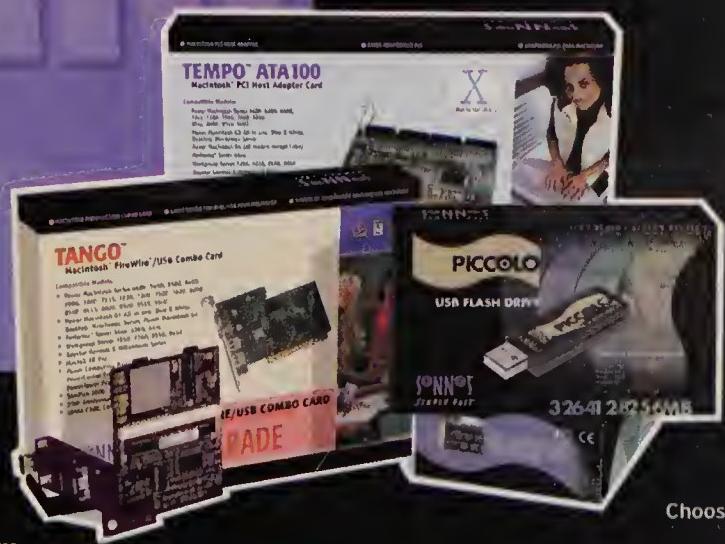


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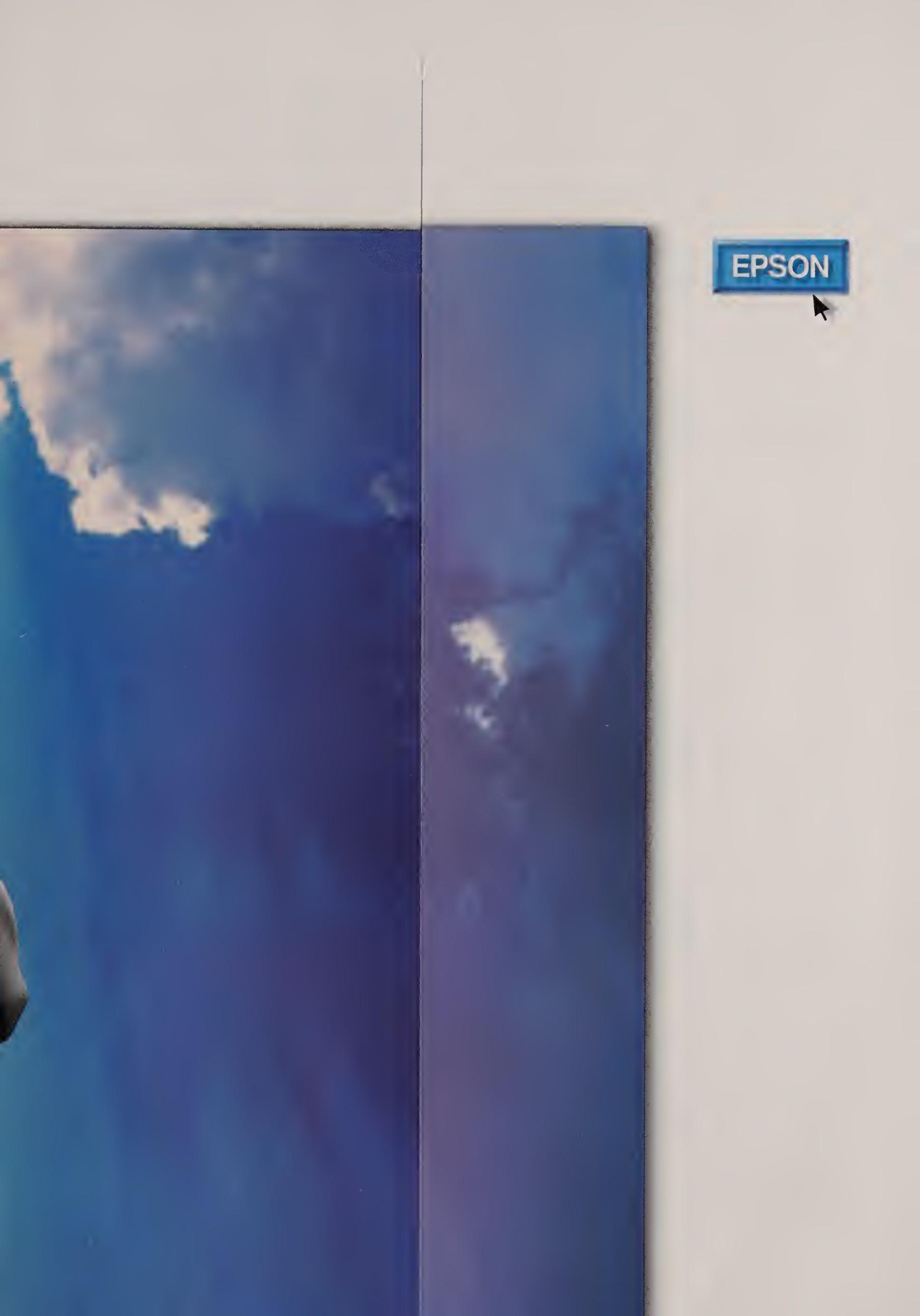
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■ With ordinary printers, you see the marble statue called David.

■ With our printers, you see a painted model named Jason.





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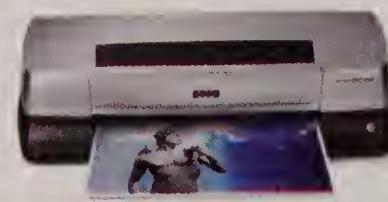


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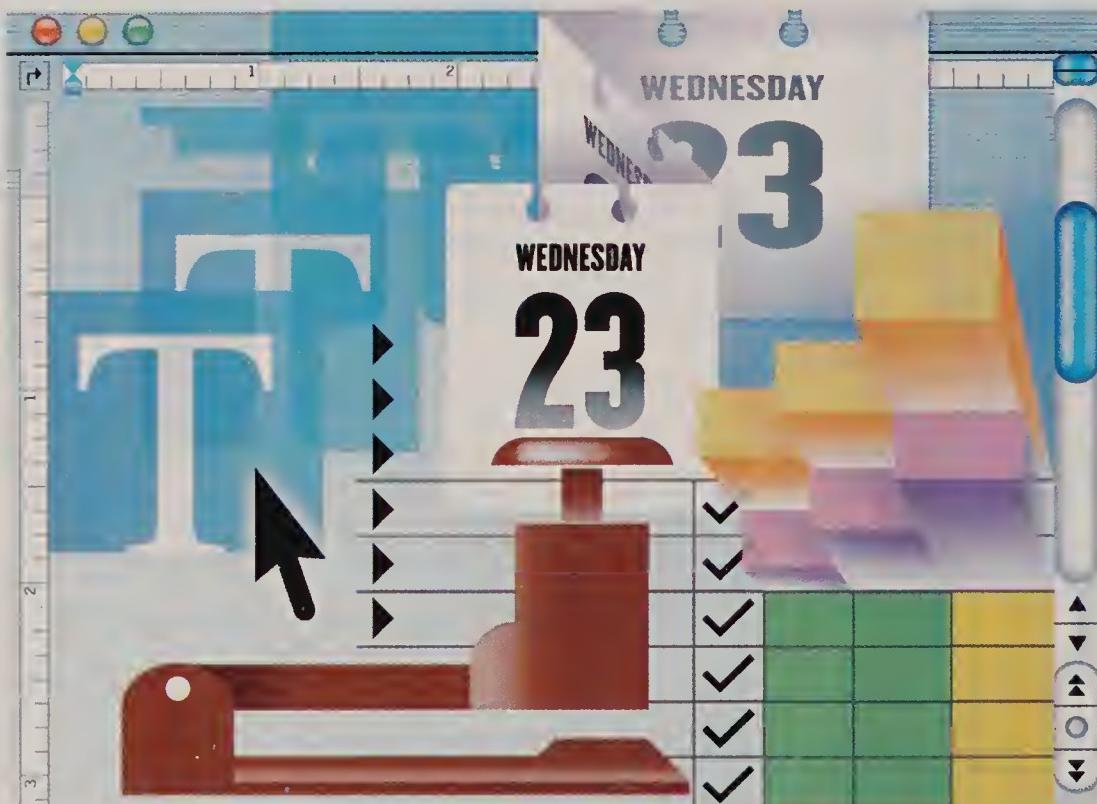
product reviews

Hands-on Evaluation and Authoritative Buying Advice

Microsoft Office v. X

High-Quality Carbonization Delivers a Strong Office Suite for OS X

BY TOM NEGRINO



THE TRICKLE OF APPLICATIONS rewritten for Mac OS X is turning into a flood, and Microsoft Office v. X, the eagerly awaited upgrade to Office 2001 (3½; *Reviews*, January 2001), provides the mainstream productivity programs Mac users have been waiting for. But Office v. X is far more than a mere port of Office to OS X. With its superior integration into the OS X environment, nicely reworked Entourage X, and improved overall performance, Office v. X is a compelling upgrade.

Office 2001 will remain available for people still running Mac OS 8 and 9, but Microsoft will be releasing only

bug fixes (not updates) for that version. Office v. X requires OS X 10.1 or later to run, and future Office development will happen only for OS X.

General Office

Office v. X demonstrates Microsoft's strong support for Apple's transition to Mac OS X. Microsoft has Carbonized the entire Office suite, and its developers have done an excellent job of implementing new technologies such as Aqua; sheets; the Quartz drawing environment; and Carbon Events, OS X's architecture for efficient multitasking.

OS X users have become accustomed to seeing the performance of

MICROSOFT OFFICE V. X

Overall: 3½

Entourage: 3½

Excel: 3½

PowerPoint: 3½

Word: 3½

Pros: Takes excellent advantage of Mac OS X features; improved Entourage X interface and calendar; fast.

Cons: No Palm synchronization with the Entourage X application; minor printing and screen redraw bugs.

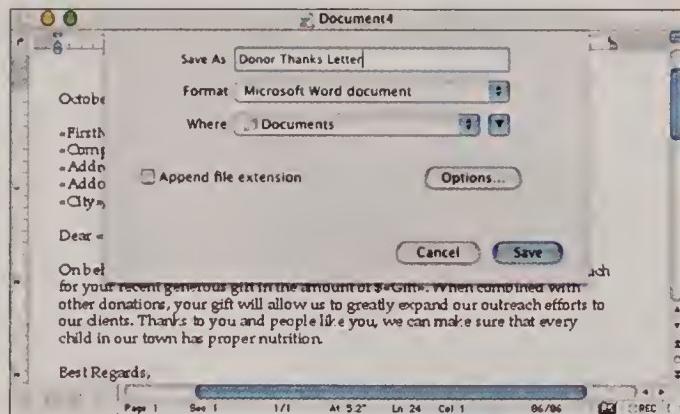
Company's estimated price: \$499; upgrade from Office 2001, \$149 (for a limited time only); upgrade previous versions, \$299.

OS compatibility: Mac OS X

Company: Microsoft, 800/426-9400, www.microsoft.com

Carbonized applications lag behind classic versions of the same programs, as with the recent Painter 7. But Office v. X shows that when Carbonization is done well, you don't have to sacrifice speed. Even on a 400MHz G4 machine, the Office programs opened quickly, usually in 5 or 6 seconds. Operations are at least as fast in Office v. X as in Office 2001, and many are faster; some tasks, such as searching through Entourage's mail database, are significantly faster.

Office 2001 introduced the Project Gallery, a handy dialog box that served as a launcher for Office 2001



Saved by Sheets Aqua's sheets allow you to switch from one document or application to another without having to first deal with an open Save dialog box.

templates. Office v. X's Project Gallery adds a Based On Recent category, which displays copies of Office documents you've recently created or worked on. Double-clicking on a copy creates a new document that includes the text of the original document, ready for modification. It's basically just a more convenient method of performing a Save As operation, but it does save a few steps.

Like Adobe and Quark applications, Office v. X sports an antipiracy serial-number verification over your Ethernet LAN. When you start up an Office program, it looks for other Office programs with the same serial number running on any other computer on the LAN; if it finds a match, it will not run. (Macworld Lab has confirmed that the check is contained within the LAN and does not send any information over the Internet to Microsoft, so this shouldn't raise privacy concerns.)

Longtime Office users will have to get used to changed keyboard commands throughout the suite. Most of these changes are due to Office's compliance with Apple's Aqua user-interface guidelines. For example, ⌘-M previously sent and received all e-mail in Entourage 2001, but Aqua reserves that keystroke for minimizing the current window to the Dock, so in Entourage X, the Send And Receive All command is ⌘-K.

A Refreshing Aqua Blast

You'll see Office v. X's embrace of Aqua as soon as you open any of the suite's programs. All of the controls

and icons sport the more colorful, rounded Aqua look. The Office programs' Save dialog boxes take advantage of Aqua's sheets, so they don't have to be dismissed before you can work in another document or application (see "Saved by Sheets"); however, Print dialog boxes do not appear as sheets.

In keeping with Aqua's more active interface, the Office applications now draw more attention to themselves when an interface changes. For example, when you show or hide the sections of the Formatting palette, the sections slide smoothly into view, rather than simply appearing, as in Office 2001. Similarly, if you drag a tool palette to an edge of your screen to make it a tool bar, the document window and other tool bars slide politely out of the way.

All the Office applications take advantage of Mac OS X's Quartz drawing technology to set the opacity of drawing objects or pictures, and PowerPoint uses Quartz's superior text manipulation to antialias text on slides for clearer presentations. Interestingly, Word does not antialias document text, because if it did, the smoothed on-screen text would not look like the same text on the printed page.

Word

With the exception of Entourage X, you won't find many new features in the Office v. X programs. Word X's primary new feature, besides interface changes, is noncontiguous text selection, which enables you to select one or more separate blocks of text in a single operation (see "Separate Selections"). Just select the first block of text, hold down the ⌘ key, and select another block. Your next operation, such as text formatting, is applied to all selected text. This is hardly

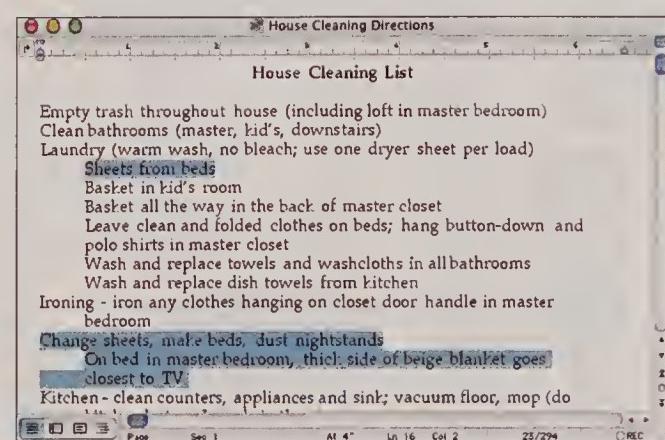
a new idea; Nisus Software's Nisus Writer has boasted noncontiguous text selection since its early days, but this a welcome addition for Word users. The new Clear Formatting command resets the text selection to the default style for that paragraph; it can be a real time-saver.

Entourage

With a full interface makeover and a heartier database, Entourage X is a big improvement on Entourage 2001. Swapping the old Outlook Express look for the coolness of Aqua, Entourage now lets you switch between its mail and personal information management (PIM) features via six large buttons, making it easier to get to the features you want to use. Microsoft has also redesigned tool bars for each of the program's main areas.

Microsoft has also reworked the Calendar utility and made it much more useful, with a new three-pane view (see "Big Calendar Changes"). In the main Calendar pane, color codes denote weekends and weekdays, events spanning multiple days are now displayed as banners rather than multiple events, and if you pause the cursor over an event, a label with the event's full name pops up. The second pane is a list of the current day's Tasks. Oddly, Calendar removes Tasks that you've marked as completed from the list, instead of striking them through, as in the separate Tasks view. The third pane contains minicalendars, which are nice, though they're not as useful as they could be. You can adjust the

continues



Separate Selections Word X lets you format several noncontiguous blocks of text in a single operation.

pane to show one or more months, but you can't view the previous month and the next month without the current month (you don't need the current month shown as a minicalendar, because you already have it in front of you in the main Calendar pane). It would also be helpful if the minicalendars displayed days with events differently from those without. Another annoyance is that there's no way to export your Calendar information out of Entourage without the help of an AppleScript.

The absence of one important Entourage feature may give many potential upgraders pause. Unlike previous versions, Entourage X cannot synchronize with Palm handhelds, because Palm Computing has not yet released the required Mac OS X-native programs, called *conduits*. Microsoft has promised to make Palm synchronization available for Entourage X, after Palm does its part, with a free downloadable update.

Microsoft has rewritten the Entourage database for increased reliability, faster performance, and integration into the multitasking OS X environment. The database is always running in the background, ready to accept events and updates from other Office programs, even when Entourage isn't open. That allows Entourage to work with the new Office Notifications program, which opens a window to let you know when scheduled reminders

come up. Office Notifications also lets you know when you have an incoming instant message in the new MSN Messenger 2.1, which is included on the Office v. X CD.

Excel and PowerPoint

Neither Excel X nor PowerPoint X has a lot of new features, but both programs benefit from OS X technologies, especially Quartz. You can now control the opacity of drawing objects, including chart elements; this ability makes for better-looking charts that are also more useful (see "See-Through Charts").

Another nice new feature in Excel is the ability to customize keyboard shortcuts. As in Word, you can add, remove, and reassign keyboard shortcuts; unfortunately, you can't customize them in Entourage or PowerPoint.

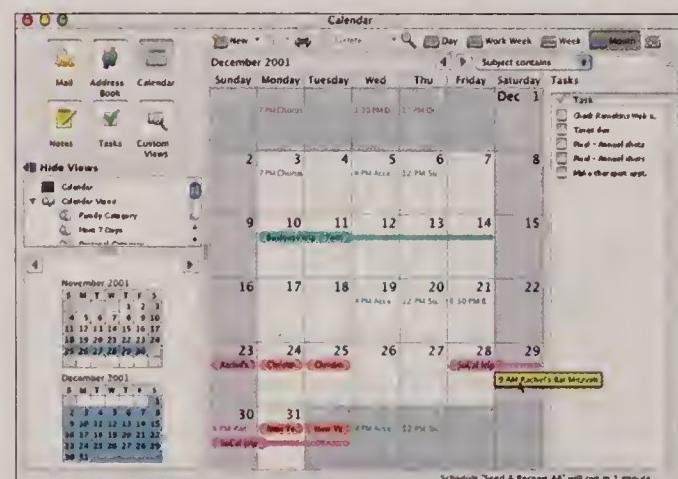
Excel X protects you from crashes with AutoRecover, which saves a snapshot of your document at intervals you specify. If an AutoRecover snapshot more recent than your last manual save is available when you reopen a document after a crash, Excel opens the snapshot and allows you to continue working.

PowerPoint's new Packages feature allows you to consolidate your presentation and any linked files, such as external images, sound, or

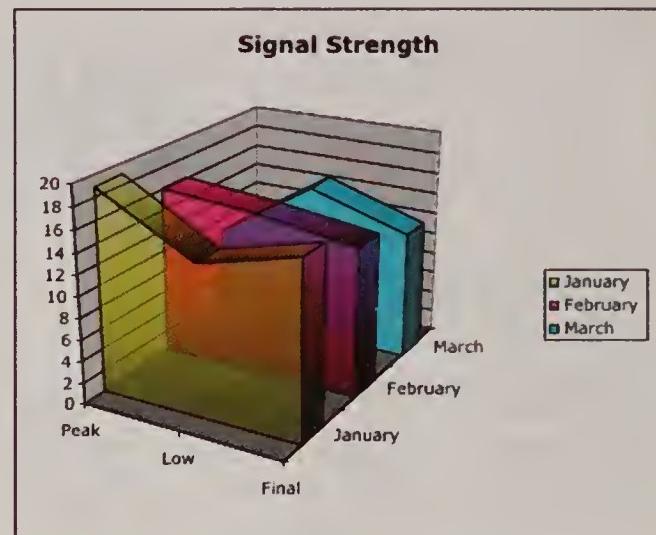
movie files, into a single folder, which you can then burn to a CD or send via e-mail; this solves the headache of file management. Export of PowerPoint presentations to QuickTime movies is also improved; they can now include interactive features such as hyperlinks and slide transitions.

Teething Pains

I found a number of bugs in Office v. X, mostly of



Big Calendar Changes No part of Office has changed as much as Entourage's Calendar. Event banners, pop-up labels, an integrated Tasks list, and better use of color make Calendar far more useful.



See-Through Charts Both Excel X and PowerPoint X enable you to control the opacity of graphic objects, allowing you to create charts that are easier to read.

the annoying but not disabling variety. PowerPoint X failed to print one slide of a presentation to a PostScript printer, even though the slide printed fine in PowerPoint 2001. Sometimes Word X could not keep up while I was scrolling through a document—the program displayed duplicated lines or distorted graphics—although the document looked fine when I stopped scrolling. In constant use and abuse over three weeks, the Office v. X programs occasionally crashed; however, they did so far less often than Office 2001's programs, which were quite reliable.

Macworld's Buying Advice

If you've made the transition to Mac OS X, you've experienced the annoyances of switching between native and classic applications. It's very likely that you've also endured the aggravation of crashing classic applications. Upgrading to Microsoft Office v. X solves both problems; the new suite provides reliability and performance superior to Office 2001's.

While these programs include few new powerhouse features, Office v. X's excellent integration with OS X technologies such as Aqua and Quartz demonstrates Microsoft's attention to detail. If you rely on Office programs, the Office v. X upgrade should be an essential part of your move to Mac OS X. **m**



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QuicKeys X 1.0

Handy Mac OS X Macro Utility Is Less Capable Than Classic Version

BY FRANKLIN N. TESSLER

For more than 12 years, savvy Mac users have used QuicKeys to automate repetitious tasks—if you used your Mac to do something, you could usually do it faster with a QuicKeys shortcut.

Thanks to QuicKeys X, from CE Software, macro fans who have made the switch to OS X won't have to abandon their favorite utility.

However, QuicKeys X's limited feature set may leave them wanting more.

Unlike QuicKeys 5, which was a control panel, QuicKeys X is an application—to install it, you simply copy it to your hard drive. Shortcuts only work when the application is running, so most users will want to visit OS X's Login Preferences panel and set QuicKeys to launch automatically at start-up. (CE Software recommends QuicKeys 5 for classic applications, although many QuicKeys X shortcuts also work in the classic Mac OS.)

Getting Around

It's easy to add, delete, and modify shortcuts using QuicKeys X's spiffy new editor. To define a shortcut, you select an operation from the Create menu or drag an icon from QuicKeys' customizable tool bar, which you can populate with your favorite QuicKeys functions. You also have to define at least one "trigger," which tells Quic-

Keys when to run the shortcut. For example, you can direct QuicKeys to go to a particular Web site 60 seconds after you launch your browser. To avoid inadvertently activating a shortcut inside the wrong application—with potentially disastrous results—you can constrain shortcuts to run only when you're using a specified program. You can also create application-specific tool bars that let you activate shortcuts with one click.

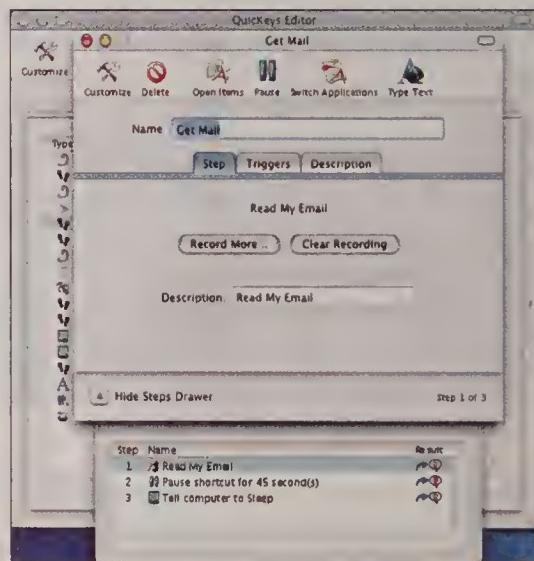
The simplest QuicKeys shortcuts consist of one operation. Multistep shortcuts, which replace QuicKeys 5's sequences, let you automate more-complicated tasks. At the bottom of the Editor window is a pop-down drawer that lists the steps you've defined for the current shortcut (see "Quick Steps"). QuicKeys X doesn't support the extensive set of sequence-programming tools that QuicKeys 5 did, but you can tell QuicKeys X to continue, skip the next step, or halt the shortcut depending on whether a given step fails or succeeds.

A Simpler Approach

One oft-repeated criticism of QuicKeys 5 was that it was relatively difficult to master. In part, QuicKeys 5's strenuous learning curve was due to the gamut of user actions it could perform, ranging from retrieving passwords to attaching files to e-mail messages. QuicKeys X's repertoire is

considerably narrower, so it's easier to learn—anybody familiar with OS X should be able to get up-to-speed quickly. (You can't import your QuicKeys 5 shortcuts into QuicKeys X.)

Unfortunately, QuicKeys X is also less capable than its predecessor. Although QuicKeys X's ability to record and play back any mouse action offers a partial workaround, it's not a substitute for the extensive



Quick Steps This multistep shortcut retrieves e-mail, pauses, and then puts the Mac to sleep.

control over menus and other interface elements version 5 provided. You can also extend QuicKeys X's functionality with AppleScript, but that's a solution most users probably won't take advantage of.

Macworld's Buying Advice

To a large extent, QuicKeys X's problems stem from a lack of appropriate tools in OS X. With some help from Apple, CE Software hopes to enhance QuicKeys X's feature set. Even with its current limitations, though, most OS X users will be able to find plenty of jobs for QuicKeys X. To see for yourself, download the free trial version from CE Software's Web site. **m**

QUICKEYS X 1.0

Rating:

Pros: Less expensive than its predecessor; easy to learn.

Cons: Limited functionality due to structure of Mac OS X.

Company's estimated price: \$60

OS compatibility: Mac OS X

Company: CE Software, 800/523-7638, www.cesoft.com

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Epson Stylus C80

Excellent Bundle of Features in a Low-Priced Ink-Jet Printer

BY RICK LEPAGE

Plenty of good ink-jet printers are available, but if you want to get one for less than \$200, you often have to sacrifice printing speed, ink capacity, or even print quality. But Epson is shaking things up with its Stylus C80; this new ink-jet printer's impressive list of features and its outstanding performance and print quality make it an unbelievable buy at \$179 (or \$149, with a mail-in rebate good until March 31, 2002).

Total Makeover

The Stylus C80 is markedly different from any other consumer printer Epson has produced. Under the hood is a new, faster print engine that the company claims is capable of printing as many as 20 black-and-white pages per minute and 10 color pages per minute. Unlike most other Epson Stylus printers, which use one tricolor (cyan, magenta, and yellow) cartridge and one black-ink cartridge, the C80 has a separate high-capacity cartridge for each of the four inks.

As is the case with most Epson printers, the C80's print quality is top-notch. With a maximum resolution of 2,880 by 720 dpi, it can print very sharp and brilliantly colored photographs on Epson's glossy and semigloss papers. A dedicated, six-

color photo printer will give you better detail and a wider tonal range, but it can't match the all-around quality the C80 can give you. This is partly due to the C80's excellent performance on plain paper. In the past, Hewlett-Packard's ink-jet printers have generally done a much better job of printing text on plain paper than any of Epson's ink-jets. The C80 is the first Epson printer we've seen that prints crisp, clear text on plain paper—even on inexpensive, 20-pound copier paper—at the printer's lowest resolution (360 dpi). And although we can't confirm Epson's claims of 70-year print longevity, we can attest to the waterproof nature of the C80 inks.

Command Performance

Few printers can hit their rated print speeds when performing real-world tasks, and the C80 is no exception. But anyone who's struggled with the slower print speeds of other low-cost ink-jets will appreciate the quick throughput of the C80, which is significantly faster than comparably priced ink-jet printers we've tested (see "Macworld's Ultimate Buyer's Guide: Printers," August 2001).

The C80's ink cartridge proved to have a long life too. We printed more than 700 pages of assorted text and graphics documents before we ran out of black ink, and the cyan, magenta,

and yellow ink cartridges were still more than 10 percent full.

Because everyone has different printing needs, your ink mileage will vary, but no matter what you print, you will find the C80's individual ink tanks to be a vast improvement over low-capacity tricolor cartridges. (The cyan, magenta, and yellow cartridges are reasonably priced at \$12 each, while the higher-capacity black cartridge costs \$33.)



A Mac OS X driver is available—for OS X 10.1 and later—as a download from Epson's Web site. The only problem we had was an occasional printing glitch in OS X, where a document would not print on the first try because of an error. (Epson is working on the issue.)

Macworld's Buying Advice

The Stylus C80 is the most exciting printer we've seen in a long time: it's an excellent general-purpose ink-jet that's equally suited to printing spreadsheets, long documents, newsletters, and photographs. What makes the Stylus C80 so notable, however, is that Epson has wrapped great performance, print quality, and print longevity in such a low-priced package. **m**

EPSON STYLUS C80

Rating:  1½

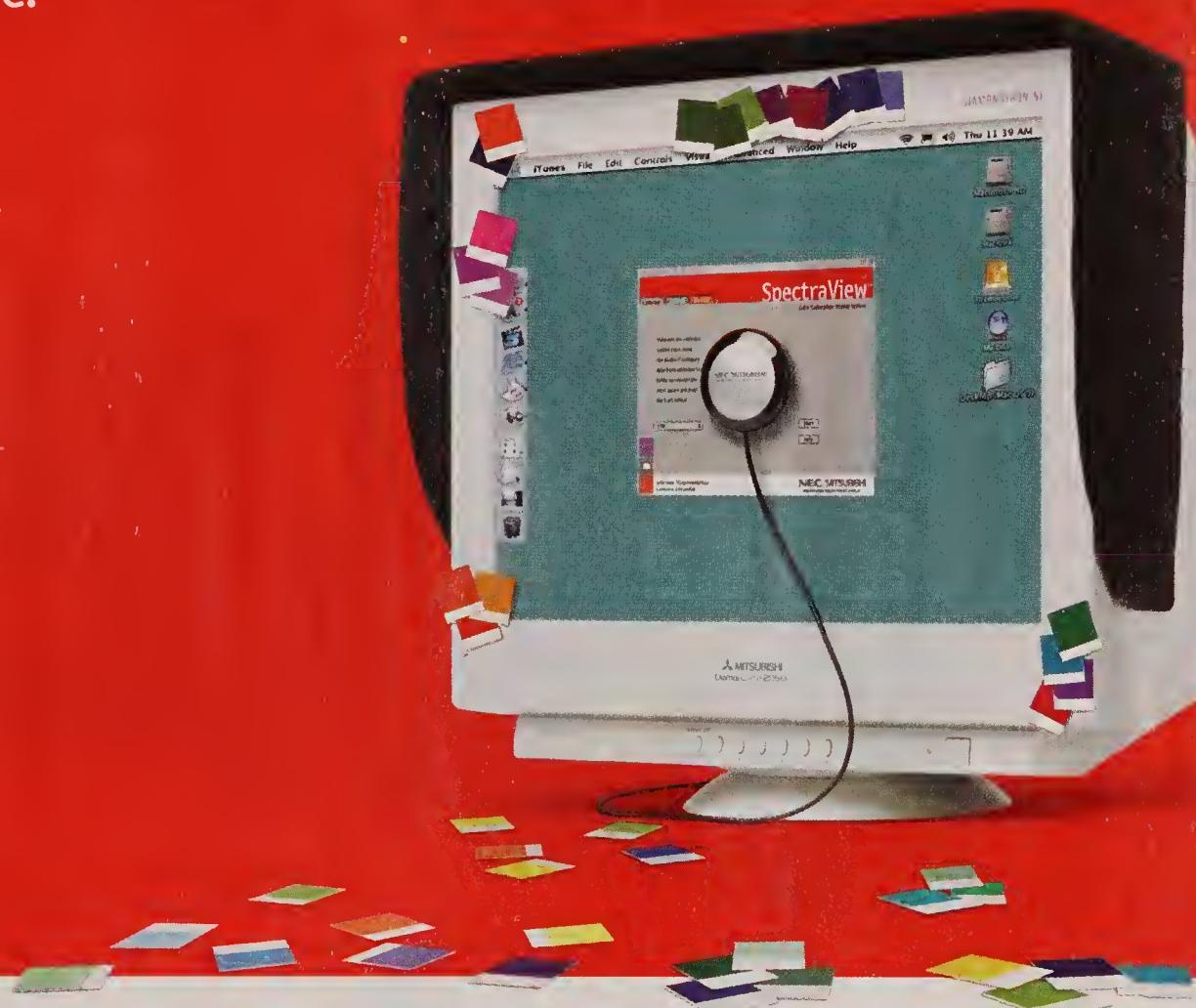
Pros: Great speed and excellent print quality, even on plain paper; economical; individual ink cartridges.

Cons: Occasional problems using OS X driver software.

Company's estimated price: \$179

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Graphics Tablets

Updated Versions Offer Better Ergonomics and Precision

BY JEFF PITTELKAU

Two of Wacom's recently shipped graphics tablets, the Graphire2 and Intuos2, are similar in appearance and function, and both perform very well. However, there are some marked differences between them that may influence your purchase; the Graphire2, though less expensive, doesn't have as many features as the Intuos2.

Affordable versus Professional

The \$100 Graphire2 is available in only one size—with an active work area of 4 by 5 inches—and is about as precise as the Intuos2. The considerably more expensive Intuos2 comes in five different sizes, which range in price from \$200, for a 4-by-5-inch tablet, to \$750, for a 12-by-18-inch one. We tested the 6-by-8-inch tablet.

Although the Intuos2 is more expensive, it has many advantages over the Graphire2, starting with the accessories that come with it. The Intuos2 includes a superior pen with a comfortable rubber grip and a solid mouse, and it supports a variety of add-on pointing devices. The Graphire2 works only with the flimsier pen and cheap-feeling mouse that come with it. Wacom has increased the Intuos2's sampling frequency to give it greater accuracy, but that improvement means it won't work with pens and mice

designed for older Intuos tablets; you'll have to buy new accessories.

How They Work

To help beginners get started, the Intuos2 and Graphire2 both include Corel's Painter Classic. In addition, the Graphire2 comes with Adobe's Photoshop LE, while the Intuos2 4-by-5-inch and 6-by-8-inch tablets come with Photoshop Elements, a version tailored specifically to photo editing. For beginners who don't own these programs, these are terrific bundles, especially considering the low price of the tablets. (The larger Intuos2 tablets don't include a version of Photoshop, as graphics pros likely own it already.)

Wacom's software offers myriad choices for customizing pen and mouse behavior. It also lets you customize multiple tablets on the same Mac.

The Intuos2's 2D mouse feels

more substantial than the Graphire2's mouse, and it includes three programmable buttons and a scroll wheel. If you invoke Extensions Manager at start-up in Mac OS 9 while you're using your Mac's mouse, neither tablet will work.

Another nice touch included only on the Intuos2 is a row of cus-

GRAPHIRE2

Rating: 

Pros: Inexpensive.

Cons: Small work area makes mouse of limited use; tablet won't work with other pens and mice.

Company's estimated price: \$100

OS compatibility: Mac OS 9, Mac OS X

Company: Wacom, 800/922-9348, www.wacom.com

INTUOS2

Rating: 

Pros: Accepts a wide variety of mice and pens; tablet detects pen angle; improved accuracy.

Cons: Incompatible with mice and pens for older Intuos tablets.

Company's estimated price: From \$200, for a 4-by-5-inch tablet, to \$750, for a 12-by-18-inch tablet.

OS compatibility: Mac OS 9, Mac OS X

Company: Wacom, 800/922-9348, www.wacom.com

tomizable buttons in the tablet's work area. And the Intuos2 can detect the pen's angle and create correspondingly fine or broad strokes. Although this feature is not supported by most graphics applications, the full version of Painter (version 6 and later) has adopted it.

Macworld's Buying Advice

The Graphire2 is great for home users and aspiring artists alike. Because of the tablet's small work area, however, you'll probably find little value in its included mouse. The larger Intuos2 models are in another class entirely. With many tablet sizes to choose from, greater precision, and expansion possibilities, the Intuos2 is a much better option for artists, architects, and designers. **m**



The Wacom Graphire2 (left) and Intuos2

LiveStage Professional 3.0

QuickTime-Authoring Program Matures but Remains Difficult to Learn

BY JIM HEID

QuickTime is more than just simple video. Apple's multimedia architecture can marry many forms of media—video, sound, text, still images, and animations made with Macromedia Flash. QuickTime movies can also contain interactivity, such as clickable buttons that lead to Web pages or even other movies.

Totally Hip Software's LiveStage Professional is the only program that can fully tap all of QuickTime's interactive capabilities. And LiveStage Professional 3.01 is an important upgrade that adds support for Flash 4, XML, and QuickTime 5. But like previous versions, LiveStage Professional 3.01 is often cumbersome and can be difficult to learn.

With version 3.01, LiveStage Professional has gone multiplatform. It's available for Windows, so you can share project files between operating systems. In addition, the Mac version now runs under both OS 9 and OS X. We tested it under OS X 10.1 with good results, though some of the program's icons and interface elements are a bit crude by Aqua standards.

Making Movies

The LiveStage 3.01 authoring process is similar to that of earlier versions.

LIVESTAGE PROFESSIONAL 3.01

Rating: 

Pros: Excellent support of QuickTime 5 features; cross-platform authoring; powerful XML capabilities.

Cons: Complex interface can be cumbersome; weak documentation.

Company's estimated price: \$950

OS compatibility: Mac OS 9, Mac OS X

Company: Totally Hip Software,
604/685-6525, www.totallyhip.com

You import existing content created in other programs, position it within the Stage window, and create scripts that specify how the content interacts (see "On LiveStage"). You can test your projects as you go, using LiveStage's debugging window to track down scripting errors. When you're finished, you can save a completed project as a QuickTime movie that will play back in any program with QuickTime support.

Many of LiveStage 3.01's enhancements take advantage of new features in QuickTime 5. For example, because QuickTime 5 supports Flash 4, LiveStage 3.01 projects can contain Flash 4 content. This enables you to create projects incorporating Flash-based dialog boxes and text-entry forms.

Another significant new feature is LiveStage 3.01's ability to import and export projects as XML text files. This makes it possible to create dynamic QuickTime movies that display different content depending on various criteria, such as the time of day.

Rough Edges

Like previous versions, LiveStage Professional 3.01 buries much of its power in a confusing interface. Changing the properties of media assets may require a journey across multiple tabs of a dia-

log box, and windows quickly litter your screen as you work. LiveStage Professional could use well-designed properties panels like those in Flash 5.

LiveStage Professional 3.01's 558-page manual seems thorough at first, but it's densely written and leans on examples and tutorials. Fortunately, Totally Hip Software has created some useful online resources—the LiveStage Developer Network (www.totallyhip.com/lstdn) and the oddly named Blue-Abuse (www.blueabuse.com), which



On LiveStage LiveStage Professional is ideal for adding enhanced interactivity to QuickTime VR movies. This project displays small, "you are here" indicators as a user navigates a multi-node panorama.

contains some fine tutorials. Even with these aids, however, LiveStage Professional is more difficult to learn than other multimedia-authoring programs.

Macworld's Buying Advice

If you're a professional QuickTime developer, you need LiveStage Professional 3.01—no other program does as good a job of tapping into QuickTime's versatility. But if you're a multimedia developer who needs interactive QuickTime only every once in a while, consider contracting with a developer who has already slogged to the summit of Mount LiveStage. This isn't a program for occasional dabbling. **m**

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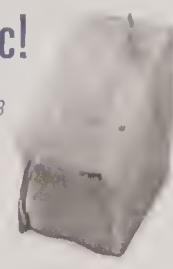
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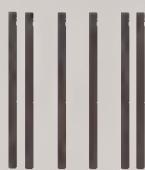
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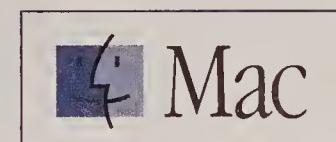
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India Titler Pro 1.0

Innovative Program Creates Animated Title Effects

BY JIM HEID

And now for something completely different: Prismo Graphic's India Titler Pro 1.0.6, a video-effects program for creating animated titles, combines a unique user interface with a huge library of canned effects that make it easy to create everything from glittering text to letters that march onto the screen. Although it has a few rough edges, serious video producers should give India Titler Pro a close look.

Most video-effects and motion-graphics programs borrow from the Adobe After Effects interface, which allows great precision but can be time-consuming and difficult to learn.

India Titler Pro discards the After Effects method in favor of a single Canvas window (see "Inside India"). To design a title, you create *tracks*, each of which can contain a line of text, an imported graphic, or a background texture. You then animate tracks by assigning to them one or more of the hundreds of effects that accompany India Titler Pro. Finally, you export the finished title as a QuickTime movie.

India Titler Pro's extensive library of effects and fonts sets it apart from other effects packages. India Titler Pro includes 27 CD-ROMs contain-

ing effects, background textures, and animated fonts. It also provides thumbnail previews of each effect—when you choose one that isn't installed, the program instructs you to insert the appropriate CD.

The program can animate text in every imaginable way—letters can bounce, slide, spray, or wiggle into place. There are also animated textures that make great backgrounds, fades and zooms that you can apply to text or graphics, and numerous glitter effects that wash across text. Some of the effects belong in late-night used-car commercials, but others are downright beautiful and wouldn't be out of place on a network news show. You can customize each effect, and India Titler Pro even has a simple scripting language, called EffectScript, for creating new effects.

Users create text in PostScript and TrueType fonts or in India Titler Pro's unique animated fonts, which are called DVFonts. The program includes 72 DVFonts; the selection ranges from gimmicky to gorgeous. In the Walk font, letters literally stroll into position. In Jitters, they tremble. In Clay, human hands quickly sculpt letters out of clay. And as you can with effects, you can create your own DVFonts, though the process is somewhat more complex.

Designers on tight budgets can opt for the \$349 India Titler, which has only 21 DVFonts and none of the supplemental CDs. For copy protection, both versions use a USB hardware key, which can inconvenience users.

For all its innovations, India Titler Pro isn't perfect. You can't switch out of the program when it's rendering, for example; nor can you use your keyboard's arrow keys to nudge text. It would be nice to see floating palettes



Inside India The word *tropical* marches into place, while *heat* appears as an animated flame and an animated texture radiates in the background.

for controlling text and effects settings, and snap-to grids for precise alignment. Prismo Graphics says it plans to add these features in a future Mac OS X-native version.

Macworld's Buying Advice

India Titler Pro is a new program, and it leaves room for improvement. But even in its first incarnation, this groundbreaking application makes short work of creating great-looking animated titles. Boris Graffiti provides more-precise controls and 3-D support, but India Titler is far faster and a better choice for folks who need excellent results quickly. **m**

INDIA TITLER PRO 1.0.6

Rating: 1/2

Pros: Simple, innovative interface; huge array of effects and animated fonts.

Cons: No arrow-key nudging; cannot render in background; USB hardware key for copy protection.

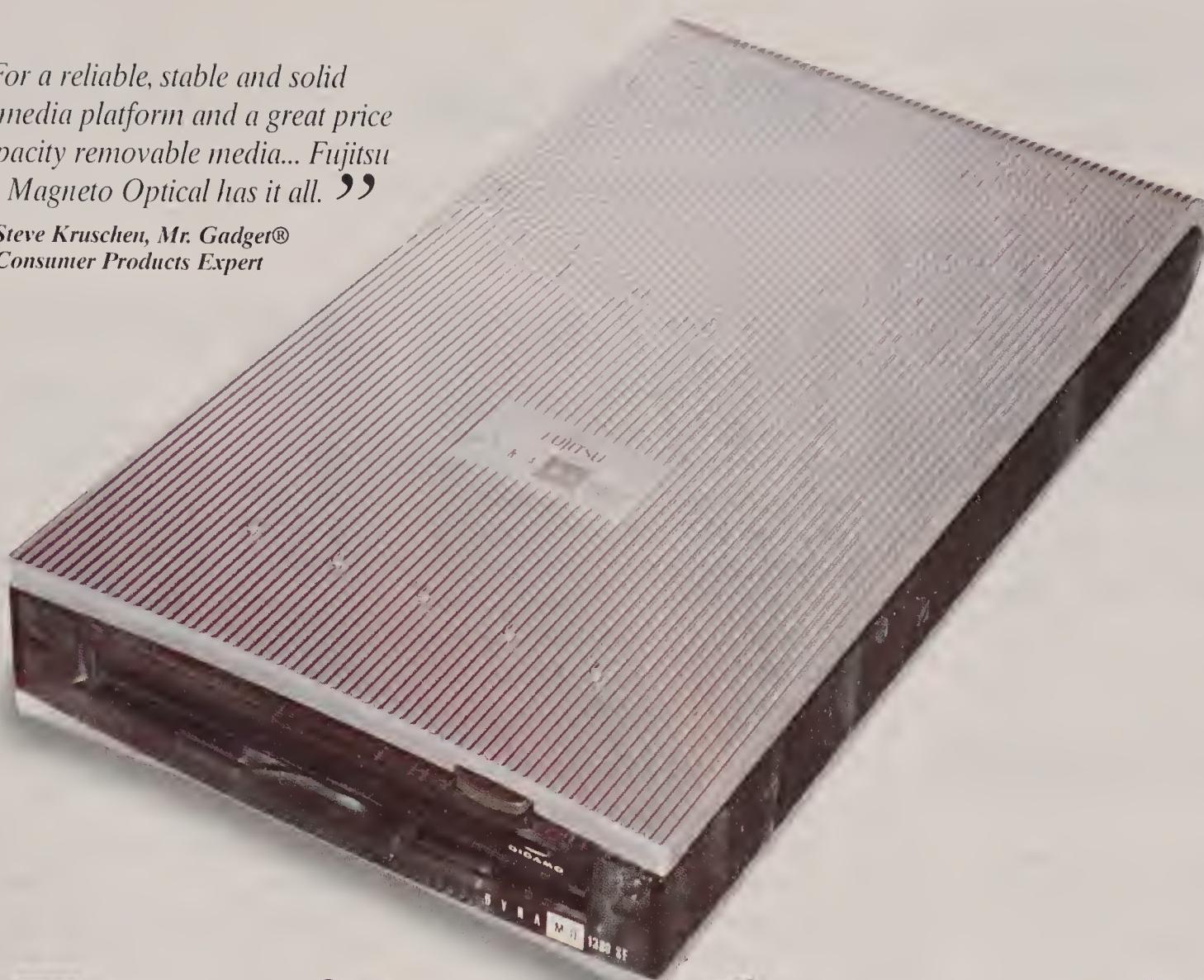
Company's estimated price: \$699

OS compatibility: Mac OS 9

Company: Prismo Graphics, 888/453-5454, www.dvfonts.com

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Macworld

The Mac Product Experts

BBEdit 6.5

Multipurpose App Does It All

BARE BONES SOFTWARE'S BBEDIT is beloved by many different kinds of Mac users, and rightly so: for Web authors, it's an excellent HTML editor; for programmers, it's a versatile coding environment; and for non-coders, it's a flexible text editor with impressive search-and-replace features. Version 6.5, which enhances Mac OS X integration and adds several other new features, is an impressive improvement of this text-editing prodigy.

X Savvy

Although version 6.1 was the program's first OS X-native incarnation, it's version 6.5 that makes BBEdit a full-fledged OS X application with significant OS X-only features. Not surprisingly, given its high level of geek cred, BBEdit has taken full advantage of OS X's Unix underpinnings. You can edit Perl, Python, and Unix shell scripts with comforts such as syntax coloring. The Worksheet Windows feature brings the power of Apple's Macintosh Programmer's Workshop to Unix. In addition, the program adds a new **bbedit** command to the command line, allowing you to open files in BBEdit directly from the Terminal application and pipe output from shell commands into BBEdit windows.

Improved All Over

BBEdit lacked strong support for Cascading Style Sheets (CSS) for a surpris-

Rating:



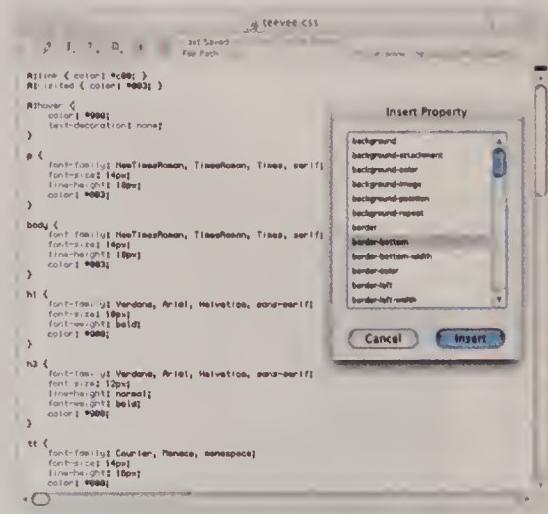
Pros: Innovative Mac OS X features; support for CSS and other languages; improved search-and-replace features.

Cons: None significant.

Company's estimated price: \$119; upgrade, \$39

OS compatibility: Mac OS 9, Mac OS X

Company: Bare Bones Software,
781/687-0700, www.barebones.com



Stylin' BBEdit 6.5 supports Cascading Style Sheets, including syntax coloring.

ingly long time. Version 6.5 rectifies that, adding syntax coloring, source formatting, and support for CSS in BBEdit's helpful Tag Maker feature. The program also now supports PHP 4, WML 1.2 and 1.3, and Objective-C. BBEdit's search-and-replace features have also been improved. File filtering has been enhanced, allowing you to filter searches based on text content, and it has been extended to work with the Find Differences command.

Most exciting for those who use BBEdit's grep-enhanced features is the new Perl-Compatible Regular Expressions pattern-matching engine. Power searchers can use back references within search patterns, take advantage of nongreedy wild-card characters, and limit wild cards to minimum and maximum match numbers. Syntax coloring of grep patterns in the Find And Replace dialog box also makes constructing and debugging complicated patterns easier.

Macworld's Buying Advice

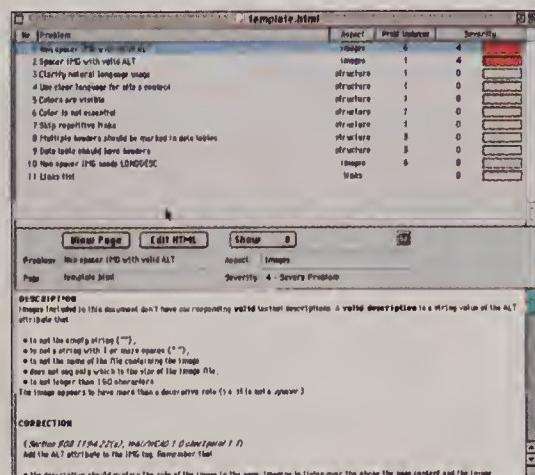
BBEdit 6.5 is an upgrade that reminds us how powerful and flexible this application is. Leading the way with innovative and far-reaching Mac OS X support, BBEdit continues to be one of the best Mac applications on the planet.—JASON SNELL

Lift Onsite 2.0

Creating the Usable Web, One Site at a Time

FEW EXPERIENCES are as necessary—or as humbling—as learning from your mistakes, whether it's getting back a geometry test or turning on the spelling-check feature and seeing a sea of red enumerating all your errors. The same principle carries over to Web-site construction. UsableNet's Lift Onsite 2.0.1, a diagnostic tool that catalogs the potential usability pitfalls in your Web site, manages to balance pitiless thoroughness with a user-friendly guide on how to correct problems.

The first order of business when using Lift Onsite is to define exactly what "usability" is. It can mean anything from a painless user experience to compliance with section 508, the federal regulation that applies the Americans with Disabilities Act to Web sites. Fortunately, Lift Onsite comes with an extensive and customizable rule set, the criteria by which the site is checked. The default settings let you test your site according to either 508 regulations or Lift Onsite's default usability definition. Be warned that this definition is quite strict. For example, one rule recommends that anyone with a Web site built around framed pages *also* provide a complete alternative for no-frames users.



Test Results After evaluating your HTML file, Lift Onsite ranks potential problems by order of severity and then provides an explanation for each at the bottom of the screen.

Rating: 1/2

Pros: Easy to learn and customize; thorough reports on site violations; smooth integration with common Web-site development tools.

Cons: Requires familiarity with W3C recommendations and conventional wisdom as to what constitutes "usable"; cannot test dynamically generated sites.

Company's estimated price: \$249

OS compatibility: Mac OS 9

Company: UsableNet, 212/965-5388, www.usablenet.com

Yet Lift Onsite allows users an extraordinary degree of customization. You can elect to turn rules on or off and weight them with a rating of 0 to 4; the higher the number, the more important it is that the rule be followed throughout the Web site. Saving different rule sets is easy, which is handy when you work on multiple sites with different usability criteria.

However, Lift Onsite is a diagnostic tool, and it still depends on human know-how. Although the software tries to explain everything, understanding and fixing usability violations requires familiarity with both W3C recommendations and current conventional wisdom about usability and accessibility. Also, Lift Onsite can check only static Web sites housed in a hard drive.

People who create dynamically generated Web sites must supplement Lift Onsite with a subscription to UsableNet's Web-based service, Lift Online.

Macworld's Buying Advice

For professional Web-site developers who need section 508 compliance, this tool is invaluable. For Web developers who also act as their own quality-assurance departments, Lift Onsite is a handy way to check for flaws and learn best-practice guidelines. However, for recreational Web heads, it might be overkill.—LISA SCHMEISER

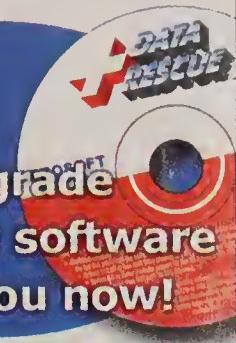
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Who's There Firewall Advisor

Firewall-Log Tool for Mac OS X Eases Analysis of System Attacks

UNWANTED ACCESS ATTEMPTS ARE a fact of network life, but firewall software logs tend to be jumbles of data that do nothing to help you uncover solutions to security problems. Open Door Networks' Who's There Firewall Advisor for Mac OS X provides analysis and filtering of access logs generated by Symantec's Norton

Rating:

Pros: Easy to use; informative; good risk-assessment tools.

Cons: Unable to identify ping access attempts by name.

Company's estimated price: \$49; multiuser packages, from \$169 for five users

OS compatibility: Mac OS X

Company: Open Door Networks,
541/488-4127, www.opendoor.com

Personal Firewall (the only OS X firewall software supported at press time).

Who's There organizes the firewall log, showing you not only the time, source, and status (allowed or denied) of each access attempt, but also the port number and corresponding type of access, along with a flag indicating the level of security risk.

When you want to analyze specific access attempts, Who's There can perform a whois search, returning full domain information. There is even a hyperlink to the source domain and a nifty map screen that pinpoints where the attack originated. It also delivers information about how these access attempts can affect OS X. Then you can take action by sending an e-mail message to either the attacker or the attacker's system administrator.

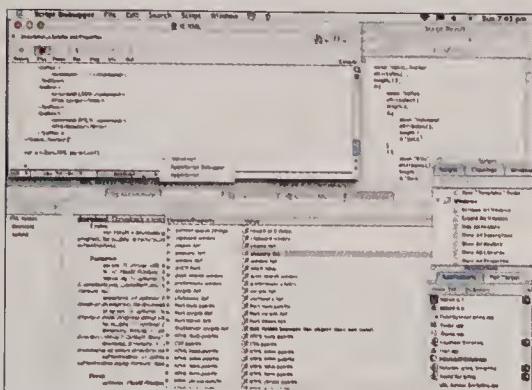
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|---|------|---------------------|-------------|-----------------------|------|--------|-----------------|-----------------|---------------------------------|
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| Date | Time | Service | IP Address | Protocol | Port | Status | Time | IP Address | Location |
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| 10/27/01 0:22:02 AM | | Simple File Sharing | 192.168.1.2 | TCP | 21 | Deny | 10/27 2001 2:13 | 212.114.232.216 | sun-01-249-61.sil.jimbohost.com |
| 10/27/01 0:22:03 AM | | Simple File Sharing | 192.168.1.2 | TCP | 21 | Deny | 10/27 2001 2:13 | 212.114.232.216 | sun-01-249-61.sil.jimbohost.com |
| 10/27/01 0:22:04 AM | | Simple File Sharing | 192.168.1.2 | TCP | 21 | Deny | 10/27 2001 2:13 | 212.114.232.216 | sun-01-249-61.sil.jimbohost.com |
| 10/27/01 0:22:05 AM | | Simple File Sharing | 192.168.1.2 | TCP | 21 | Deny | 10/27 2001 2:13 | 212.114.232.216 | sun-01-249-61.sil.jimbohost.com |
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| 10/27/01 0:22:10 AM | | Simple File Sharing | 192.168.1.2 | TCP | 21 | Deny | 10/27 2001 2:13 | 212.114.232.216 | sun-01-249-61.sil.jimbohost.com |
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| 10/27/01 0:22:16 AM | | Simple File Sharing | 192.168.1.2 | TCP | 21 | Deny | 10/27 2001 2:13 | 212.114.232.216 | sun-01-249-61.sil.jimbohost.com |
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| 10/27/01 0:22:18 AM | | Simple File Sharing | 192.168.1.2 | TCP | 21 | Deny | 10/27 2001 2:13 | 212.114.232.216 | sun-01-249-61.sil.jimbohost.com |
| 10/27/01 0:22:19 AM | | Simple File Sharing | 192.168.1.2 | TCP | 21 | Deny | 10/27 2001 2:13 | 212.114.232.216 | sun-01-249-61.sil.jimbohost.com |
| 10/27/01 0:22:20 AM | | Simple File Sharing | 192.168.1.2 | TCP | 21 | Deny | 10/27 2001 2:13 | 212.114.232.216 | sun-01-249-61.sil.jimbohost.com |
| 10/27/01 0:22:21 AM | | Simple File Sharing | 192.168.1.2 | TCP | 21 | Deny | 10/27 2001 2:13 | 212.114.232.216 | sun-01-249-61.sil.jimbohost.com |
| 10/27/01 0:22:22 AM | | Simple File Sharing | 192.168.1.2 | TCP | 21 | Deny | 10/27 2001 2:13 | 212.114.232.216 | sun-01-249-61.sil.jimbohost.com |
| 10/27/01 0:22:23 AM | | Simple File Sharing | 192.168.1.2 | TCP | 21 | Deny | 10/27 2001 2:13 | 212.114.232.216 | sun-01-249-61.sil.jimbohost.com |
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| 10/27/01 0:22:27 AM | | Simple File Sharing | 192.168.1.2 | TCP | 21 | Deny | 10/27 2001 2:13 | 212.114.232.216 | sun-01-249-61.sil.jimbohost.com |
| 10/27/01 0:22:28 AM | | Simple File Sharing | 192.168.1.2 | TCP | 21 | Deny | 10/27 2001 2:13 | 212.114.232.216 | sun-01-249-61.sil.jimbohost.com |
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| 10/27/01 0:22:36 AM | | Simple File Sharing | 192.168.1.2 | TCP | 21 | Deny | 10/27 2001 2:13 | 212.114.232.216 | sun-01-249-61.sil.jimbohost.com |
| 10/27/01 0:22:37 AM | | Simple File Sharing | 192.168.1.2 | TCP | 21 | Deny | 10/27 2001 2:13 | 212.114.232.216 | sun-01-249-61.sil.jimbohost.com |
| 10/27/01 0:22:38 AM | | Simple File Sharing | 192.168.1.2 | TCP | 21 | Deny | 10/27 2001 2:13 | 212.114.232.216 | sun-01-249-61.sil.jimbohost.com |
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| 10/27/01 0:22:45 AM | | Simple File Sharing | 192.168.1.2 | TCP | 21 | Deny | 10/27 2001 2:13 | 212.114.232.216 | sun-01-249- |

Script Debugger 3.0

AppleScript Development Environment Adds Features, OS X Capabilities

BEFORE APPLESCRIPT STUDIO appeared on the scene in early December 2001, Late Night Software's Script Debugger was the only AppleScript development environment for Mac OS X.

Script Debugger 2 led the pack with a powerful Explorer view and the ability to handle scripts larger



The Bilingual Debugger Script Debugger 3.0.1 can handle AppleScript and JavaScript.

than 32K, and version 3.0.1 sports many improvements, including the ability to break on exceptions (to stop a script's execution) and enhanced Script Error dialog boxes. The handy Script Manifest tool allows you to identify every scripting addition and application a given script references.

Also new are the Expressions window and Console palette, which allow you to execute code against a currently running script. Using these two features, you can check and modify a script's progress.

AppleScript can be difficult to learn, and Script Debugger 3.0.1 includes JavaScript OSA, which allows you to use that language instead of AppleScript.

The new version doesn't bridge every gap, though. Late Night con-

Rating: 1/2

Pros: Mac OS X compatible; supports both AppleScript and JavaScript.

Cons: Incompatible with Microsoft Word and Excel 2001 and earlier.

Company's estimated price: \$189

OS compatibility: Mac OS 9, Mac OS X

Company: Late Night Software, 888/999-3210, www.latennightsw.com

firms that, due to a bug, you still can't script Microsoft Word or Excel 2001 and earlier. However, this bug has been fixed for Office v. X apps.

Macworld's Buying Advice

With its helpful new features and ability to script OS X, Script Debugger 3.0.1 is an improvement on a great development environment.—DORI SMITH

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occurs. Visit www.Alsoft.com for details.

Nik Sharpener Pro

Clever Plug-in Reduces Halo Effect and Offers Output Profiles

ADOBE PHOTOSHOP'S UNSHARP Mask filter compares each pixel in an image with its neighboring pixels—the greater the difference between two pixels, the more it increases the contrast. In addition to other undesirable results, this causes a halo effect around edges that seems to increase an image's sharpness. If the image is de-

Rating:

Pros: Sharpens images optimally and automatically; offers profiles for different output devices.

Cons: Expensive compared with other Photoshop plug-ins.

Company's estimated price: \$330

OS compatibility: Mac OS 9

Company: Nik Multimedia, 619/725-3150, www.nikmultimedia.com

tined for print, there will be an unfortunate difference between its on-screen version and how it looks on paper after being put through the halftoning print process.

Nik Sharpener Pro is a clever Photoshop plug-in that not only sharpens images but also offers output profiles designed to retain an image's integrity, whether it's being sent to a laser or ink-jet printer or to an offset press.

Sharpener Pro's options appear in Photoshop's Filter menu, and all trigger an easy-to-use preview window. The image-quality options are optimized by default, so they rarely need tweaking. The eye-distance setting simulates the distance between the final image and the viewer (a magazine as opposed to a poster, for



Sharpen Simply Use Sharpener Pro's preview window to easily adjust your sharpened image.

example), and the printer-quality slider lets you compensate for varying paper and printer standards.

Macworld's Buying Advice

Nik Sharpener Pro will be a boon for graphics pros who use Photoshop's Unsharp Mask feature and want to reduce the halo effect.—SEAN ASHCROFT



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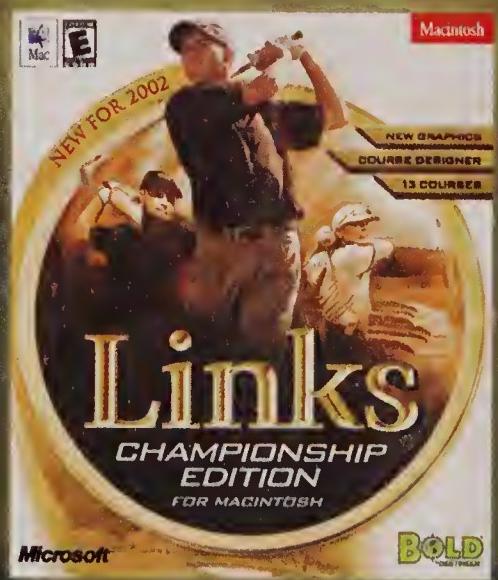
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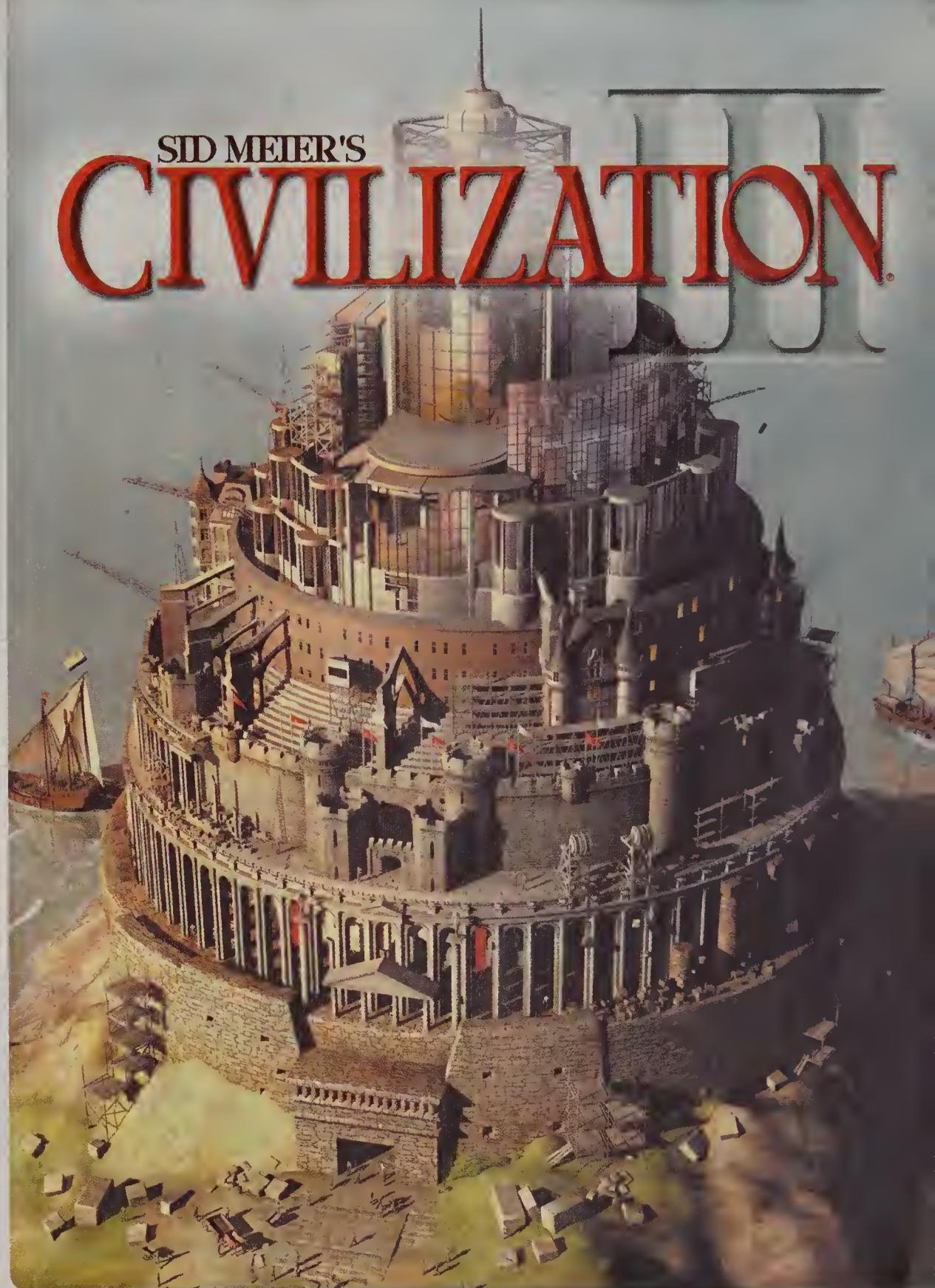
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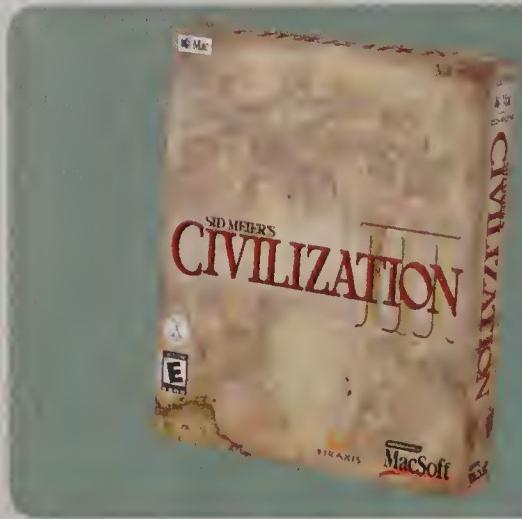
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The Game Room

Some kinds of games have become so plentiful on the Mac that unless a new title brings something truly fresh to its genre, it can easily grow stale very soon after it comes out of the box. So this month, our Game Room subjects—Red Faction, from GraphSim, and Otto Matic, from Aspyr—are two outstanding new 3-D-action games that boast decidedly unique features.

Otto Matic for the People

The plot of Otto Matic was drawn straight from Hollywood B movies. The setting is 1957, and Giant Brain from Planet X is bent on enslaving Earth's citizens. He sends his fleet of Brain Aliens to our planet so they can collect specimens, but Otto Matic comes to humanity's rescue. Heroic Otto is able to save people by teleporting them to his escape rocket before the aliens beam them into their flying saucers, but he must physically touch them to do it. He must also collect supplies such as rocket fuel before he can launch his craft.

From Otto's own Flash Gordon-style rocket ship to the spinning flying saucers to the theremin-inspired soundtrack, the game revels in its Saturday-afternoon science-fiction origins. Where it differs is in production quality. Otto Matic sets a new standard for what the Mac can do as a gaming platform. Produced by Aspyr Media and created by Pangea Software, it's unquestionably Pangea's most polished game to date. It sports some of the most luscious graphics that you'll see on this or any other platform. And Otto Matic's whimsical and witty subject matter make the game fun for kids and adults alike.

Otto Matic Transmission

Otto Matic is a third-person-action game—you're positioned behind and slightly above Otto Matic as you help him navigate from level to level. Because of that and other design details, there's a superficial resemblance to Pangea's



Pretty Face Lush color, great detail, beautiful lighting, and particle effects make Otto Matic a beauty to behold.

game Bugdom. But this is no sequel, and it's no rehashed version—it's a brand-new game with unique appeal.

Thanks to his hollow metal body, Otto can store various weapons, including a ray gun, a flare gun, a freeze gun, and other handy destructive gadgets. He also collects power-up atoms by punching open Power Up Pods or punching out Brain Aliens. Some power-up atoms recharge Otto's health, and others fuel jet packs in his feet that enable him to fly over

otherwise impassable terrain. Otto must also collect rocket fuel, which enables him to take off from a planet's surface once he completes a level.

Around every corner, you'll find yet another hostile alien or indigenous life-form ready to pounce on Otto. Fortunately, though, small radar-dish-equipped transmitters serve as checkpoints, allowing you to restart from different waypoints in each level if Otto is dismantled. However, you can't save a game at checkpoints—an infuriating limitation.

Otto Matic's methods for getting through each level are quite ingenious. At one point he has to rappel along a zip line. He combats alien clowns in a bumper-car hovercraft. He water-skis. He even grabs the controls of an alien's flying saucer.

Otto Matic's interface is fairly intuitive. Health, jet-pack, and rocket-fuel meters all take the form of glowing colored discs at the top of the screen. The larger the radius

of the glowing disc, the greater the supply. Other handy meters show you the weapons and ammo you have and how many earthlings are left to rescue.

There's no question in my mind that *Otto Matic* is a showcase Mac game. If you're looking for a 3-D-action game that's safe for the whole family but fun, challenging, and beautiful to watch, get this game.

A Miner Miracle

On its surface, *Red Faction* is in tried-and-true territory. It's a first-person shooter in which you must make your way through sometimes claustrophobic tunnels and rooms while collecting weapons and power-ups. As Parker, a miner on the planet Mars, you toil away in the subterranean (actually, sub-Martian) mines of the giant, oppressive Ultor Corporation. When the miners are stricken by a deadly plague, Ultor's response is to ignore the problem—miners have been treated like livestock for years.

It isn't long before the miners revolt, and you, as Parker, become central to the revolution. You make your way from the mines to the planet's surface and then to satellites orbiting Mars as you attempt to unravel the mystery of the plague and bring down Ultor.

This game exhibits a key difference from many in this genre. It's the first to use the Geo-Mod engine, which introduces the concept of deformable terrain. Basically, if your weapon is high-powered enough, you can blast holes through walls, carve chunks out of cavern passages, or blow fissures into floors. The idea of deformable terrain didn't originate with *Red Faction*, but the game's designers have taken it further than I've seen before. While you'll find the occasional structure you can't blast apart, Geo-Mod makes it possible to blast holes through walls and floors to gain access to areas you couldn't otherwise.

Miners Must Be Accompanied by a Guardian

Geo-Mod isn't the only thing in *Red Faction* that adds a level of realism, and some of that realistic detail is, frankly, grotesque. As Parker, you're dishing out a heaping helping of righteous vengeance to the same Ultor henchmen that have abused and subjugated you and your brothers- and sisters-in-arms for years, and it's payback time. Just like Hammurabi, you're exacting an eye for an eye, a tooth for a tooth, and a head shot for a head shot. If you're turned off by games with a lot of gored characters begging for their lives, you probably won't like *Red Faction*.

Red Faction's single-player levels require straightforward travel from point A to point B. It has the find-the-hidden-lock puzzles that are ubiquitous in third-person action games, and they're little more than excuses to load



Miner Chaos Among your weapons in *Red Faction* are tools that can blow holes in floors, walls, and other structures.

new levels or areas in the game. There are also some varied missions and objectives you have to accomplish—you can even commandeer vehicles along the way—but ultimately *Red Faction* is a 3-D-action game.

If that's what you're looking for, *Red Faction* delivers, and it's a fine way to introduce the Geo-Mod engine to hardcore gamers. I like blowing holes in walls. It's destructive, violent, and oddly cathartic.

The developer, Volition, did a good job in porting

this game itself (rather than handing it over to a Mac game-conversion company). When launching the game, I ran into the occasional glitch that caused me to restart my Mac, but I didn't experience any major problems. You can tweak the game's detail levels, and so forth, in the options screens.

All told, *Red Faction* brings some fresh features and a whole wheelbarrowful of fun into the first-person-action category. For fans of the genre, it's worth checking out.

Macworld's Buying Advice

Otto Matic is a showcase Mac game. If you like 3-D-action games, this one is a must-have. *Red Faction* is a solid addition to the library of first-person-action games for the Mac, especially if you like blowing holes in things. **m**

PETER COHEN is often mistaken for a fleshy-headed Brain Alien, but he usually spends his days toiling in the MacCentral.com mines as a senior editor.

For more game reviews, visit www.macworld.com/columns/gameroom/.

OTTO MATIC

Rating: 4 1/2

Pros: Top-notch graphics and music; fun game play.

Cons: No in-level saves.

Company's estimated price: \$35

OS compatibility: Mac OS 9, Mac OS X

Company: Aspyr Media, 888/212-7797, www.aspyr.com

RED FACTION

Rating: 4

Pros: Deformable terrain puts a new twist on the first-person shooter.

Cons: Predictable and somewhat boring level design.

Company's estimated price: \$45

OS compatibility: Mac OS 9, Mac OS X

Company: GraphSim Entertainment, 972/386-7575, www.graphsim.com

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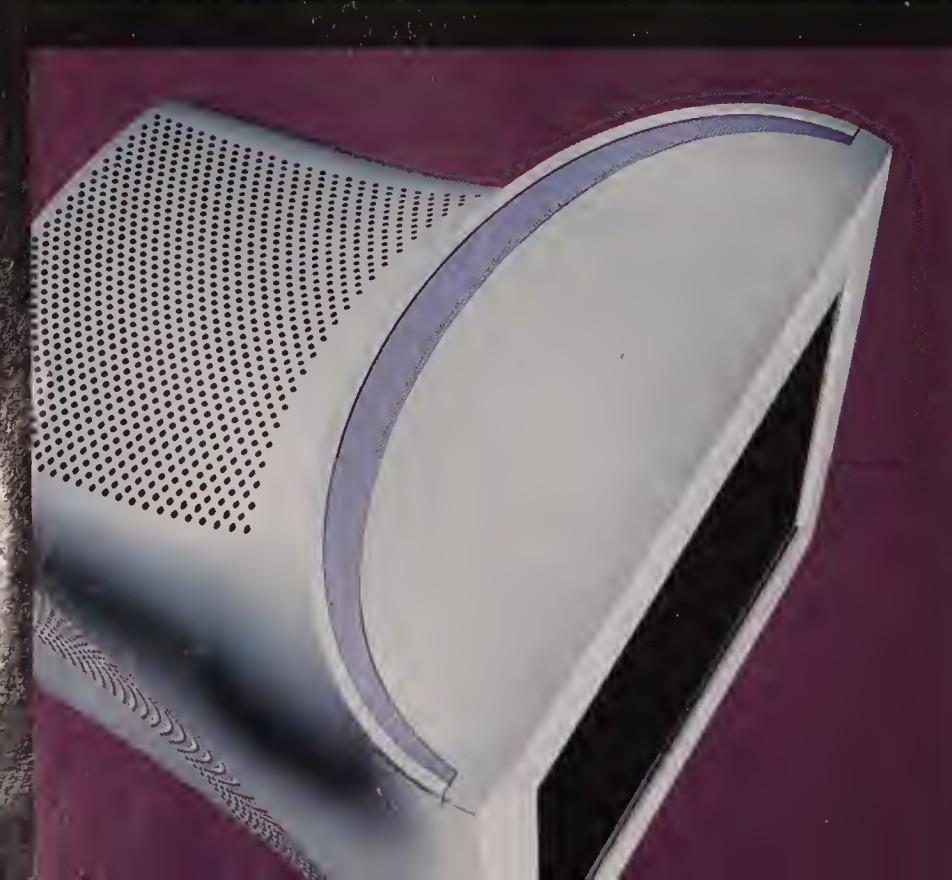
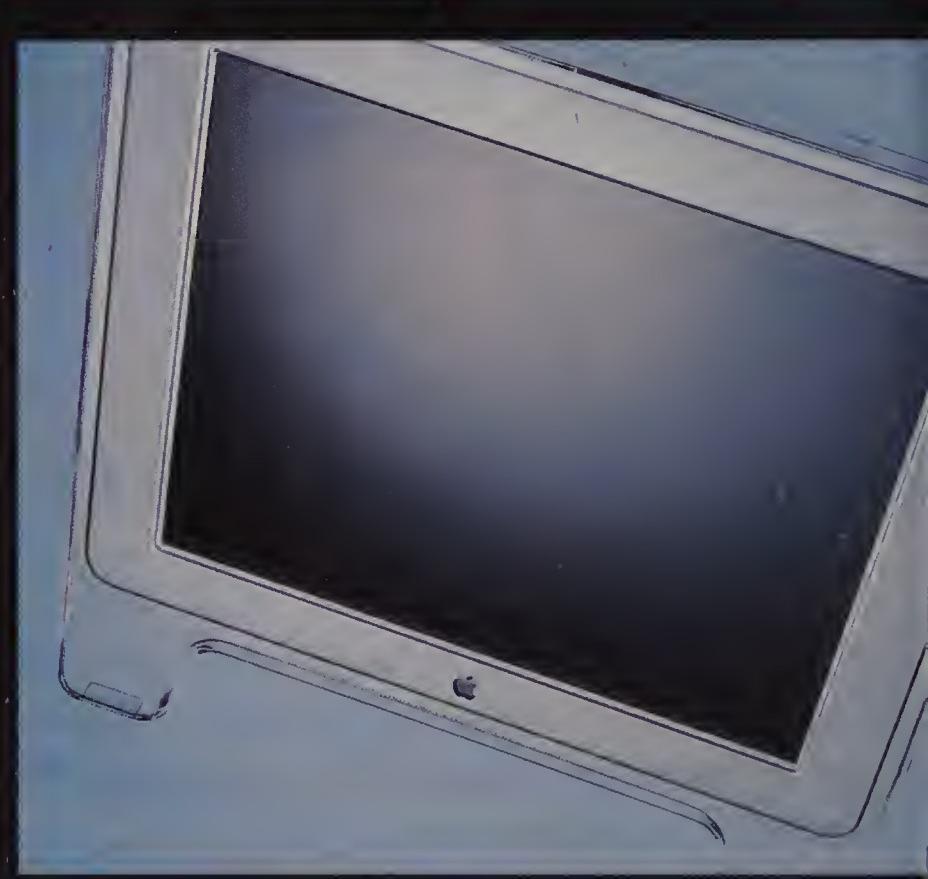
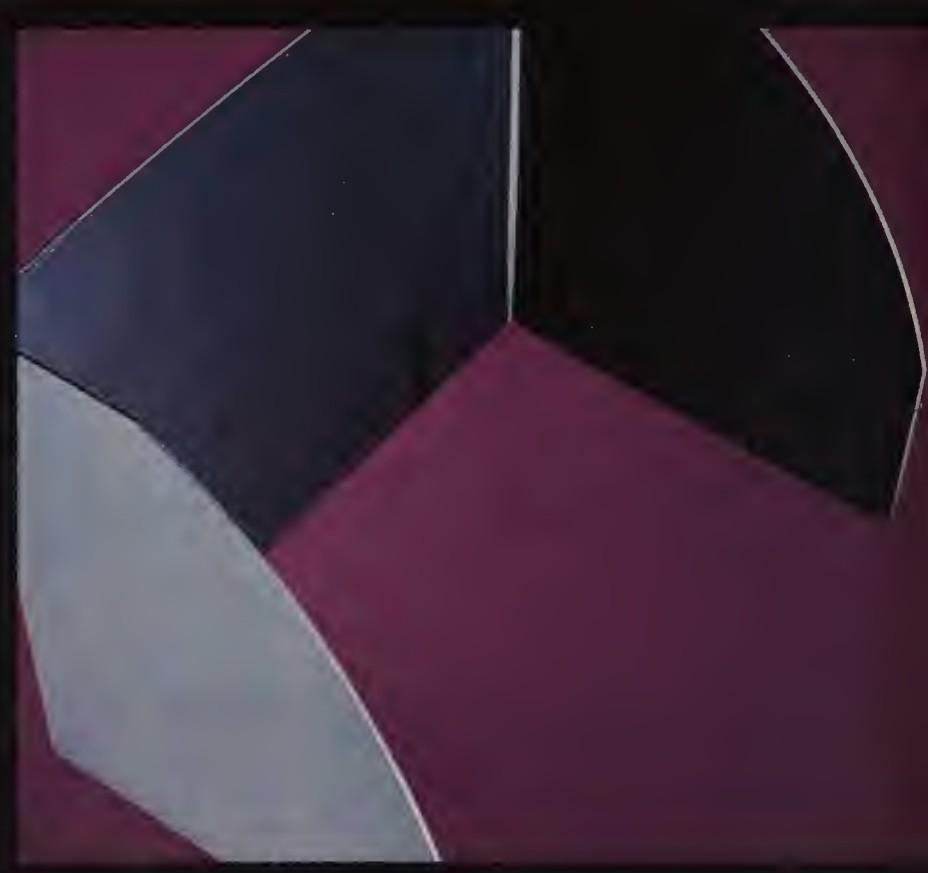
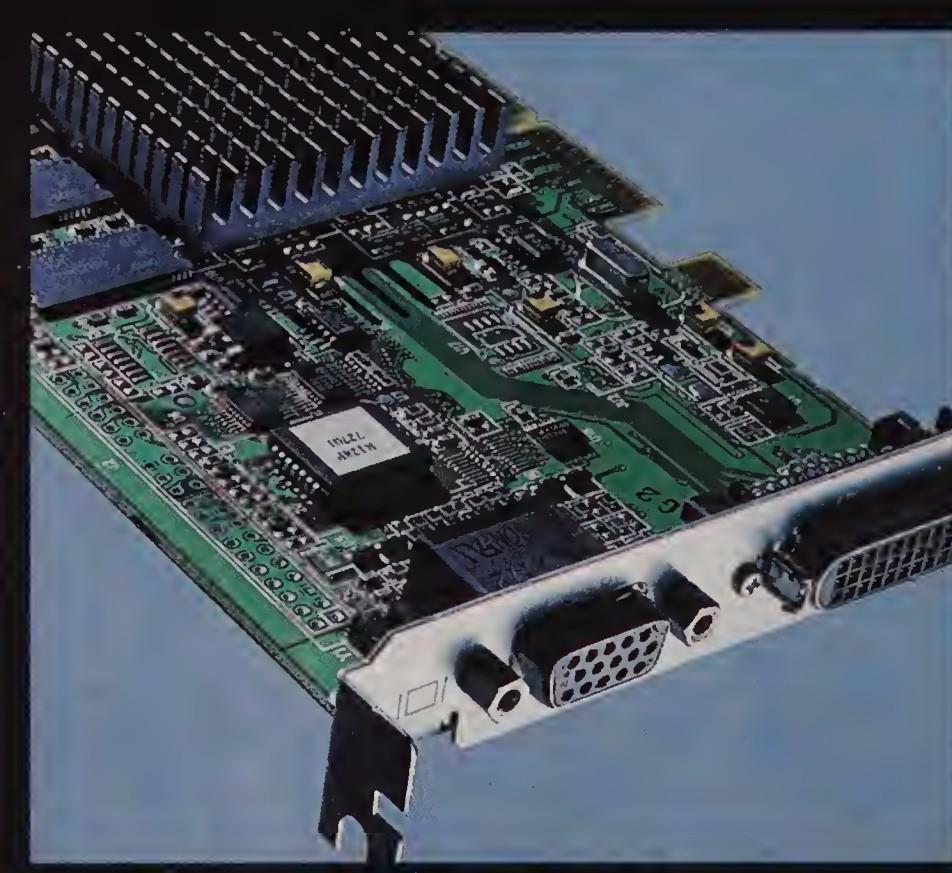
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We Test 37 Displays to Find the Right One for You

MACWORLD'S ULTIMATE BUYERS' GUIDE

MONITOR GUIDE

Your Mac is a powerful tool. It performs extremely complex calculations, renders 3-D animations, and even helps you with your taxes. But what good is all that power if you can't see the results? The fundamental bridge between you and your data isn't Mac OS or your applications—it's your monitor.

Only a few short years ago, buying a monitor involved choosing a size of cathode-ray tube (CRT) display—a decision that usually boiled down to how much room you had on your desk and how much money you wanted to spend. Then along came liquid-crystal display (LCD) monitors—also known as flat panels—a new type of monitor with strengths and weaknesses that set it apart from the CRT. In the past year, Apple has completely abandoned stand-alone CRTs in favor of a new line of LCDs. And while we have strong reservations about using them for color-critical work (see "The Color Challenge," June 2001), LCDs can be just fine for everyday use.

To help you decide which technology is right for you, whether it's for your home or for a business, we put together this guide. And to make your decision even easier, Macworld Lab put 37 displays, in three categories—17-inch LCDs, 19-inch CRTs, and 21-inch CRTs—through their paces. (We picked these sizes because they're common purchases and generally the best choices for daily use; for a roundup of 15-inch LCDs, see *Reviews*, September 2001.) The monitors were judged on everything from text sharpness and color fidelity to ease of use (see "A Perfect Fit," "Big and Beautiful," and "Large and in Charge" for results), so when you're trying to find that new monitor, you won't have to feel around in the dark.

BY DAVID MORGESTERN AND JONATHAN SEFF

PHOTOS BY KEVIN TWOMEY

“Because CRTs don’t have physical pixels, you can adjust the resolution of your monitor over as wide a range as it supports and still have a crisp display.”

Choosing a Monitor Technology

The most obvious difference between traditional CRT monitors and new flat-panel displays is the way they’re shaped. But the differences go far beyond size alone—these two monitor types employ radically different technologies, which greatly affect how things look on screen (see “Behind the Image” for more details). Unlike with TV sets, however, you can’t just walk into a store and look at a dozen monitors, displaying identical images, side by side. It would be impractical, and most stores wouldn’t have a wide enough selection of models on hand. And you may decide to buy a monitor online, where there’s no way to visually compare models.

We’ll start by helping you choose between a CRT and an LCD; then we’ll show you what to look for in a particular monitor. (See “4 Questions to Ask Yourself” for further help in choosing one of the two technologies.)

CRT Monitors

When people talk about monitors, they’re usually referring to CRTs—chances are, you have one on your desk. CRTs are great if you need

accurate, stable color and don’t want to spend too much money; however, they’re bulky, and they can show annoying flicker.

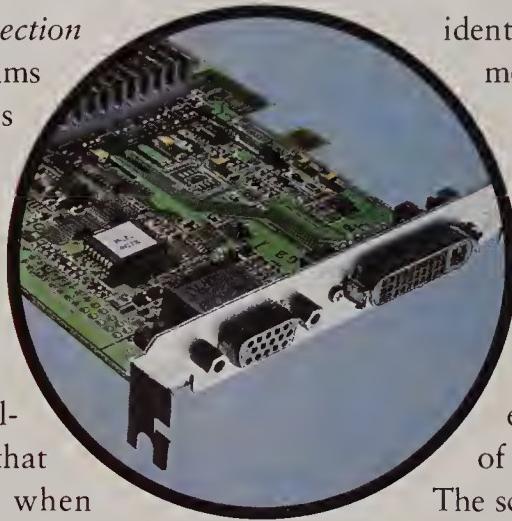
How They Work A CRT is basically a big, vacuum-sealed tube with an array of three electron guns at its back—one each for red, green, and blue (RGB)—that aim beams of electrons toward the screen at its front. Electromagnets, housed in a device called a *deflection yoke*, redirect the beams into a continuous zigzag scan from left to right and top to bottom, covering the entire screen.

The front of the tube is coated with millions of RGB-colored phosphor dots that glow momentarily when hit, or *excited*, by the beams, forming the display’s color pixels. The closer they’re packed together, the higher the resolution supported by the screen; the degree of separation is called *dot pitch*, and it usually falls between 0.20mm and 0.26mm. By regulating the energy of each

beam, the gun creates different combinations of colored light, including white. Between the guns and the front of the tube is a thin metal veil with millions of openings—called an aperture grille or a shadow mask, depending on the technology used—that helps focus the beam. Aperture-grille tubes create brighter images and more contrast than comparable shadow-mask CRTs; you can identify an aperture-grille monitor by the faint horizontal lines near the top and bottom of its screen.

Like motion-picture film, CRT technology depends on visual persistence, a characteristic of human perception.

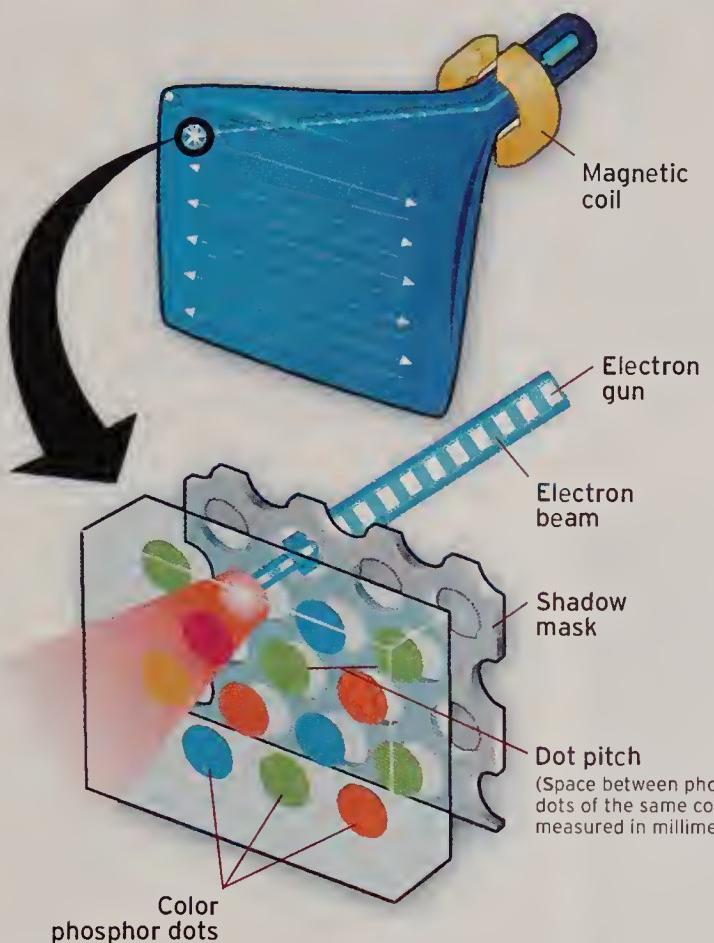
The scanning of the beams across a screen happens so quickly—usually between 65 and 95 times per second—that our brains are fooled into seeing the screen as one complete image. The speed at which the screen redraws, or the *refresh rate* of the beams across the screen, is measured in hertz (Hz).



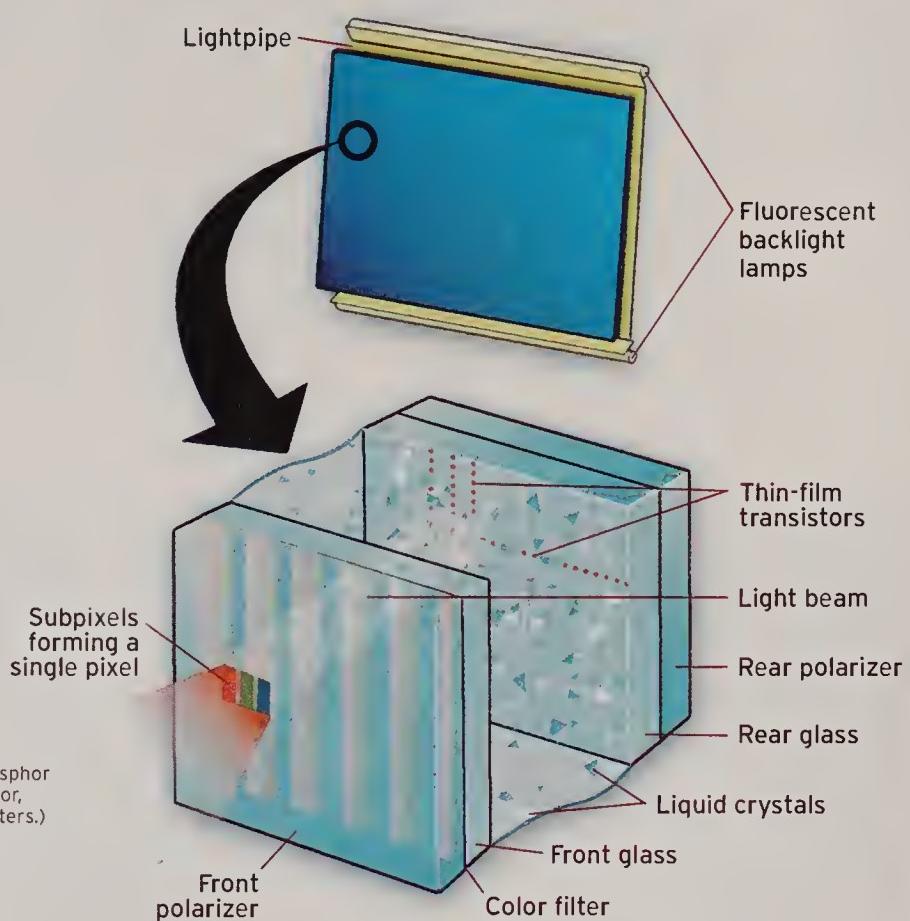
17-INCH LCDS



COLOR CRT TECHNOLOGY



COLOR LCD TECHNOLOGY



Behind the Image The different technologies in CRTs and LCDs have a great impact on how things look on screen, from color to viewing angle.

Pros and Cons CRT technology has been around for a long time, and one of the benefits of this longevity is low price. General-use 19-inch CRTs are typically priced between \$300 and \$500, and similar 21-inch CRTs cost between \$500 and \$800.

When it comes to color, you can't beat a CRT. Even though it can take some adjusting (a process known as *calibration*), a CRT gives you much more control over things such as color temperature than an LCD. And

because of the way the phosphors on the inside of a CRT monitor scatter light evenly when activated by an electron beam, images retain fidelity even when you view the monitor from the side.

Because CRTs don't have physical pixels, you can adjust the resolution of your monitor over as wide a range as it supports and still have a crisp display.

To produce proper colors, however, a CRT's electron beams must

use just the right amount of energy to send a signal to just the right dot on the screen. When one of the beams is out of alignment, it acts like an electronic shotgun, hitting the phosphor dots it's aimed at, as well as others nearby of different colors. The result is colored splotches in the corners or the middle of the screen. To counteract this, some monitors provide controls to adjust the *purity* settings of colors in corners.

continues



Philips
170B



Planar
17.4-Inch Multi-Media
Monitor



Proview
PL765



Samsung
SyncMaster
170MP



Samsung
SyncMaster
170T



Samsung
SyncMaster
760vTFT

BALANCED FORM AND FUNCTION

IF YOU LOVE YOUR MAC'S SLEEK DESIGN, a svelte LCD monitor may be the perfect complement to your desktop decor. With a flicker-free screen and a tiny footprint, an LCD is easy on the eyes in more than one sense. Macworld Lab compared 15 17-inch flat-panel displays—ranging in price from \$550 to \$1,350—intended for general use in the home or office (see "37 Displays Compared"). Although LCD prices seem steep compared with the average cost of a 19-inch CRT, we found that Neovo's \$999 X-174 provided great performance at a reasonable price.



The Neovo X-174

Hooking Up

Before you start your search for the perfect LCD, look at the back of your Mac. Today's monitors offer one or more of the following connections: VGA, DVI, and ADC (Apple Display Connector). A screen hooked up through a digital DVI or ADC connection yields sharper, clearer images than one connected via analog VGA. The ADC port combines a DVI signal with power and USB connectivity. The single cable leaves your desk relatively clutter free; however, ADC is available only on cards shipping in newer Power Mac G4s.

Except for Apple's 17-Inch Studio Display and the Formac gallery 1740, each of the flat panels in this roundup can plug directly into an analog VGA connector, which means they're compatible with current and older desktops and laptops. Of these models, five

have both analog and digital inputs: the Neovo X-174, Iiyama's Pro Lite 44a, Philips's 170B, Planar's 17.4-Inch Multi-Media Monitor, and Samsung's SyncMaster 170T. These monitors are the most broadly compatible, as they can plug into either standard VGA or DVI connectors and, with an adapter, into ADC ports. The Apple and Formac displays require the ADC port available only on recent G4 desktops, although DVI-to-ADC adapters are available from Dr. Bott (877/611-2688, www.drbott.com) and Gefen (800/545-6900, www.gefen.com) for \$150 to \$200. (At press time,

Formac was planning to release a \$50 adapter in December.)

Small but Wiry

All but two of these monitors have controls on the bottom of the front panel; Envision's EN-7100e has them hidden along the top edge, and on Neovo's X-174, they're located discreetly along the right edge, with button names printed on the front. The Samsung SyncMaster 170MP, with its tiny silver buttons, has the most elegant-looking set of controls and also some of the easiest to use. On dual-mode (analog and digital) models, however, many controls—for example, phase, timing, and position—are designed to compensate for errors during the conversion of graphical data from digital to analog and back, so they're not available in digital mode.

Pick a Card

The only significant setup problem we came across was with the SyncMaster 170T, which didn't work with the ATI Radeon card at the monitor's native SXGA resolution (1,280 by 1,024 pixels at 60Hz) when we connected it via DVI. It displayed the picture for a few seconds before going blank. The monitor worked fine at this resolution with ATI's Rage Pro and Nvidia's GeForce2 cards. Samsung attributed the problem to the ATI Radeon card, which outputs a signal that is outside of industry standards. The company said that future shipments of the monitor will be fully compatible with the ATI Radeon card.

With the Nvidia GeForce2 graphics card, all of the digital panels had difficulty displaying some non-recommended resolutions. An LCD's native resolution is based on the number of red, green, and blue pixel bundles. The panels have 1,280 columns and 1,024 rows of pixel sets—set to a lower resolution of 1,024

continues

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by 768 pixels, for example, the monitor must enlarge, or scale, the image to fill the screen. For some resolutions, both the Nvidia graphics card and the in-panel electronics attempted to scale the image, with strange results. Selecting a mode in the Monitors control panel that isn't marked "stretched" allows the monitor to display lower resolutions more accurately.

Image Quality

LCDs aren't fit for professional color work, but some models can compete with general-use CRTs. The X-174, the Studio Display, the SyncMaster 170T, the Formac gallery 1740, and ViewSonic's VE170 ViewPanel produced richer blacks and rendered the spectrum of colors more accurately than the other monitors in our test group, which offered acceptable results, although colors on Acer's FP751 and Preview's PL765 appeared slightly washed out. Adjusting the FP751's controls helped a bit, but we were unable to improve the PL765's color.

To evaluate photographic detail, we checked for color saturation and details in highlights and shadows. The NEC MultiSync LCD1700M+ and Formac gallery 1740 delivered the best results in this category, producing bright, saturated images with detail in a broad range of areas, and the Studio Display was close on their heels. Conversely, over-exposed highlights and murky shadow areas were typical on the FP751, the EN-7100e, and to a lesser extent, the PL765.

In our text test, the Studio Display and Multi-Media Monitor produced the cleanest, most readable type, but no monitor managed an excellent rating. The PL765 eked out an acceptable rating with text that was not as crisp but still readable, whereas the EN-7100e rendered unacceptably blurry text.

A Single Viewer

Because LCDs use backlights, they suffer from limited viewing angles; images can change radically as you view your monitor from various angles. The X-174, LCD1700M+, and Pro Lite 44a displayed colors most consistently over the widest area. The gallery 1740 also performed well in this test. The Studio Display and SyncMaster 170T tended to lose dark and unsaturated colors as angle increased. Colors on Acer's FP751 quickly inverted (and the screen took on a pink tint) as we moved to its sides.

Features

The most fully outfitted model is the SyncMaster 170MP, which includes a TV tuner with remote

| | ••• Excellent •• Acceptable • Poor | MOUSE RATING | TEXT SHARPNESS | COLOR QUALITY | PHOTO DETAIL | VIEWING ANGLE |
|--------------------------------------|--|--------------|----------------|---------------|--------------|---------------|
| Acer FP751 | ••• | •• | •• | • | • | • |
| Apple 17-Inch Studio Display | •••½ | •• | ••• | ••• | ••• | •• |
| Envision EN-7100e | ••½ | • | •• | • | • | •• |
| Formac gallery 1740 | •••• | •• | ••• | ••• | ••• | •• |
| Iiyama Pro Lite 44a | ••• | •• | •• | •• | •• | •• |
| NEC MultiSync LCD1700M+ | •••½ | •• | •• | ••• | ••• | ••• |
| Neovo X-174 | •••• | •• | ••• | •• | ••• | ••• |
| Philips 170B | ••• | •• | •• | •• | •• | •• |
| Planar 17.4-Inch Multi-Media Monitor | ••• | •• | •• | •• | •• | •• |
| Preview PL765 | ••• | •• | •• | •• | •• | •• |
| Samsung SyncMaster 170MP | •••½ | •• | •• | •• | •• | •• |
| Samsung SyncMaster 170T | •••½ | •• | ••• | •• | •• | •• |
| Samsung SyncMaster 760vTFT | ••½ | •• | •• | •• | •• | •• |
| ViewSonic VE170 ViewPanel | •••½ | •• | ••• | •• | •• | •• |
| ViewSonic VG175 ViewPanel | ••• | •• | •• | •• | •• | •• |

We conducted subjective tests and ranked quality as excellent, acceptable, or poor. We rated each monitor according to how well it displayed our Adobe Photoshop, Microsoft Word, and DisplayMate test images. We tested each monitor using a Power Mac G4/466 with DVI-equipped ATI Radeon graphics cards, setting dual-mode monitors to digital mode. We set displays to 1,280-by-1,024-pixel resolution with 24-bit color.—Macworld Lab testing by James Galbraith

control; speakers; and VGA, S-Video, and composite-video inputs. The FP751 includes speakers, a USB hub, and Kensington lock ports. Both the Pro Lite 44a and ViewSonic VG175 include Portrait Display's MacPivot software for rotating the monitor from landscape to portrait mode in OS 9 (at press time, Portrait Display said it had no plans to update the software for OS X).

Macworld's Buying Advice

Although CRTs are more affordable and produce sharper text and more-accurate color, LCDs are continuing to improve on all counts. If you've been wishing for more room on your desk, we recommend the Neovo X-174. It's not the least expensive in the bunch, but it has a wide viewing angle and produces excellent color. In addition, it accepts VGA, DVI, and S-Video inputs. If your Mac has an ADC port on its graphics card, you'd be wise to check out the Formac gallery 1740, which has a larger screen and produces great detail, at a price that's \$100 lower than Apple's 17-Inch Studio Display.—JAMES GALBRAITH AND BONNIE HUIE

EDITORS' CHOICE

••• Neovo X-174 The X-174's excellent color, wide viewing angle, and wide array of inputs make it a great LCD worth its price. Company: Neovo (866/246-3686, www.neovo-usa.com) Company's estimated price: \$999



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37 DISPLAYS COMPARED

| COMPANY | PRODUCT | MOUSE RATING | COMPANY'S ESTIMATED PRICE | CONTACT | DOT PITCH (IN MM)* | VIEWABLE SIZE (IN INCHES) | TECHNOLOGY |
|---------------------|-------------------------------|--------------|---------------------------|---------------------------------------|--------------------|---------------------------|----------------------|
| 17-INCH LCDS | | | | | | | |
| Acer | FP751 | ★★★ | \$799 | 888/723-2238, www.acer.com | N/A | 17.0 | LCD |
| Apple | 17-Inch Studio Display | ★★★½ | \$999 | 800/692-7793, www.apple.com | N/A | 17.0 | LCD |
| Envision | EN-7100e | ★★½ | \$549 | 510/770-0468, www.envisionmonitor.com | N/A | 17.0 | LCD |
| Formac | gallery 1740 | ★★★★ | \$899 | 877/436-7622, www.formac.com | N/A | 17.4 | LCD |
| Iiyama | Pro Lite 44a | ★★★ | \$1,353 | 800/394-4335, www.iiyama.com/us | N/A | 17.0 | LCD |
| NEC | MultiSync LCD1700M+ | ★★★½ | \$849 | 800/632-4662, www.necmitsubishi.com | N/A | 17.0 | LCD |
| Neovo | X-174 ★ | ★★★★ | \$999 | 866/246-3686, www.neovo-usa.com | N/A | 17.0 | LCD |
| Philips | 170B | ★★★ | \$799 | 800/531-0039, www.philipsusa.com | N/A | 17.0 | LCD |
| Planar | 17.4-Inch Multi-Media Monitor | ★★★ | \$693 | 866/752-6271, www.planar.com | N/A | 17.4 | LCD |
| Provew | PL765 | ★★★ | \$549 | 800/776-8439, www.proview.net | N/A | 17.0 | LCD |
| Samsung | SyncMaster 170MP | ★★★½ | \$1,224 | 800/726-7864, www.samsungmonitor.com | N/A | 17.0 | LCD |
| | SyncMaster 170T | ★★★½ | \$864 | 800/726-7864, www.samsungmonitor.com | N/A | 17.0 | LCD |
| | SyncMaster 760vTFT | ★★½ | \$799 | 800/726-7864, www.samsungmonitor.com | N/A | 17.0 | LCD |
| ViewSonic | VE170 ViewPanel | ★★★½ | \$799 | 800/888-8583, www.viewsonic.com | N/A | 17.0 | LCD |
| | VG175 ViewPanel | ★★★ | \$899 | 800/888-8583, www.viewsonic.com | N/A | 17.0 | LCD |
| 19-INCH CRTS | | | | | | | |
| CTX | PR960FL | ★★½ | \$449 | 626/709-1000, www.ctxintl.com | 0.24 | 18.0 | Flat aperture grille |
| Eizo | FlexScan F730 | ★★★ | \$459 | 800/800-5202, www.eizo.com | 0.26 | 17.9 | Shadow mask |
| | FlexScan T765 | ★★★ | \$689 | 800/800-5202, www.eizo.com | 0.25 | 17.8 | Flat aperture grille |
| Hewlett-Packard | P920 | ★★★ | \$429 | 800/752-0900, www.hp.com | 0.24 | 18.0 | Flat aperture grille |
| Hitachi | CM721F | ★★★ | \$279 | 800/441-4832, www.hitachidisplays.com | 0.20 | 18.0 | Flat shadow mask |
| Iiyama | Vision Master Pro 451 | ★★½ | \$456 | 800/394-4335, www.iiyama.com | 0.25 | 18.0 | Flat aperture grille |
| Mitsubishi | Diamond Pro 920 | ★★★ | \$419 | 800/632-4662, www.necmitsubishi.com | 0.24 | 18.0 | Flat aperture grille |
| Philips | 8Brilliance 109P | ★★★ | \$450 | 800/531-0039, www.philipsusa.com | 0.24 | 18.0 | Flat aperture grille |
| Samsung | SyncMaster 900NF | ★★★ | \$389 | 800/726-7864, www.samsungmonitor.com | 0.25 | 18.0 | Flat aperture grille |
| | SyncMaster 955DF | ★★★½ | \$279 | 800/726-7864, www.samsungmonitor.com | 0.24 | 18.0 | Flat shadow mask |
| Sony | CPD-G420S ★ | ★★★½ | \$530 | 800/571-7669, www.sony.com | 0.24 | 18.0 | Flat aperture grille |
| | HMD-A400/L | ★★★ | \$500 | 800/571-7669, www.sony.com | 0.24 | 18.0 | Flat aperture grille |
| ViewSonic | P95f | ★★★ | \$439 | 800/888-8583, www.viewsonic.com | 0.25 | 18.0 | Flat aperture grille |
| 21-INCH CRTS | | | | | | | |
| CTX | PR1400F | ★★★½ | \$829 | 626/709-1000, www.ctxintl.com | 0.24 | 19.8 | Flat aperture grille |
| Eizo | FlexScan T962 | ★★★★ | \$1,189 | 800/800-5202, www.eizo.com | 0.24 | 19.6 | Flat aperture grille |
| Hitachi | CM823F | ★★★ | \$799 | 800/441-4832, www.hitachidisplays.com | 0.21 | 20.0 | Flat shadow mask |
| Iiyama | Vision Master 505 | ★★★ | \$699 | 800/394-4335, www.iiyama.com | 0.25 | 20.0 | Shadow mask |
| KDS | VS-21e | ★★★½ | \$499 | 800/237-9988, www.kdsusa.com | 0.22 | 19.9 | Shadow mask |
| Philips | 8Brilliance 201B | ★★★ | \$699 | 800/531-0039, www.philipsusa.com | 0.25 | 20.0 | Shadow mask |
| Sony | CPD-G520 ★ | ★★★★ | \$799 | 800/571-7669, www.sony.com | 0.24 | 19.8 | Flat aperture grille |
| | GDM-F520 | ★★★★ | \$1,699 | 800/571-7669, www.sony.com | 0.22 | 19.8 | Flat aperture grille |
| ViewSonic | P225 | ★★★ | \$799 | 800/888-8583, www.viewsonic.com | 0.25 | 20.0 | Shadow mask |

* = Editors' Choice. * Dot-pitch comparisons are valid only within categories—shadow mask or aperture grille; N/A = not applicable (LCDs don't employ phosphor dots).

Another significant disadvantage of CRTs is their size—a 21-inch monitor can hog almost an entire desktop. Furthermore, CRTs are both heavy and cumbersome. A 19-inch CRT can weigh as much as 60 pounds, and a 21-inch CRT can reach 80 pounds.

CRTs can also be very temperamental, and their color performance can be affected by a wide range of environmental conditions—including

temperature and the impact of being shipped or moved.

In addition, small magnetic fields can build up on the inside surface of a CRT, causing inaccurate colors and distortions. Most monitors have a *degaussing coil*, however, that fixes such problems.

Because a CRT's scan line is constantly marching across the screen, getting a stable, flicker-free image can be difficult. As the phosphors on the

screen are excited and then re-excited with each refresh cycle, the edges of text can betray a slight fuzzy bloom. If you stare at your monitor all day long or read a lot of on-screen text, this can take a toll on your eyes.

Another drawback of some CRTs is curved screen surfaces, which make CRTs susceptible to reflections and glare—a real problem if you work near a window or have light shining from behind you. There are now flat-

| MAXIMUM RESOLUTION (IN PIXELS) | CONNECTION | USB | PROS | CONS |
|--------------------------------------|---------------------|-----|---|--|
| 1,280 × 1,024 | VGA | yes | Kensington lock; speakers. | Poor detail and viewing angle. |
| 1,280 × 1,024 | ADC | yes | Excellent color; one cable carries power, USB, and digital signal. | Expensive; limited compatibility. |
| 1,280 × 1,024 | VGA | no | Inexpensive. | Soft text; poor detail. |
| 1,280 × 1,024 | ADC | yes | Excellent image detail; one cable carries power, USB, and digital signal. | Limited compatibility. |
| 1,280 × 1,024 | Dual mode (VGA/DVI) | yes | Pivot feature; speakers. | Very expensive. |
| 1,280 × 1,024 | VGA | no | Excellent text quality; speakers. | Most expensive analog panel. |
| 1,280 × 1,024 | Dual mode (VGA/DVI) | no | VGA, DVI, S-Video, and composite-video inputs; excellent color quality. | Glass cover can reflect glare. |
| 1,280 × 1,024 | Dual mode (VGA/DVI) | no | Good color. | Poor viewing angle. |
| 1,280 × 1,024 | Dual mode (VGA/DVI) | yes | Least-expensive dual-mode model; speakers. | Thick, bulky design. |
| 1,280 × 1,024 | VGA | no | Inexpensive; speakers. | Soft text; poor detail. |
| 1,280 × 1,024 | VGA | no | Integrated TV tuner; easy-to-use controls; speakers. | Expensive. |
| 1,280 × 1,024 | Dual mode (VGA/DVI) | no | Excellent color; easy-to-use controls; Kensington lock. | Problems with ATI Radeon card. |
| 1,280 × 1,024 | VGA | no | Easy-to-use controls; Kensington lock. | Poor viewing angle; soft text. |
| 1,280 × 1,024 | VGA | no | Excellent color; Kensington lock. | Bare-bones feature set. |
| 1,280 × 1,024 | VGA/VGA | no | Two analog inputs; pivot feature; Kensington lock. | Lackluster performance. |
| 1,600 × 1,200 | VGA/8NC | yes | Dual inputs switchable via front panel. | Couldn't tune color setting for accuracy; noisy. |
| 1,600 × 1,200 | VGA | no | Advanced color controls. | Awkward one-button control; fine text blurry. |
| 1,920 × 1,440 | VGA/8NC | yes | Advanced color controls; dual inputs switchable via front panel. | Expensive; awkward one-button control. |
| 1,920 × 1,440 | VGA | no | Good uniformity; OSD exit function. | Loss of shadow detail. |
| 1,600 × 1,200 | VGA | no | Inexpensive. | Poor uniformity; icon-only OSD. |
| 1,920 × 1,440 | VGA/VGA | yes | Speakers; accurate built-in color setting; switchable dual inputs. | Poor timing support; visible moiré and noise. |
| 1,600 × 1,200 | VGA | no | Solid performance. | Limited connectivity. |
| 1,920 × 1,440 | VGA/BNC | no | Dual inputs switchable via front panel. | Washed-out image; visible moiré pattern. |
| 1,600 × 1,200 | VGA/8NC | no | Dual input. | Text not as sharp as on less-expensive Samsung. |
| 1,280 × 1,024 | VGA | no | Inexpensive; crisp text; few problems. | Below-average uniformity. |
| 1,800 × 1,440 | VGA/VGA | no | Color controls; automatic sync; switchable dual inputs; speaker. | Slight noise apparent. |
| 1,600 × 1,200 | VGA | yes | Attractive styling. | Awkward one-button control. |
| 1,920 × 1,440 | VGA/BNC | no | Superior automatic sync; dual input. | Visible moiré pattern. |
| 2,048 × 1,536 | VGA/VGA | yes | Good color; multiple host inputs; flat screen. | Jittery text; heavy. |
| 1,920 × 1,440 | VGA/BNC | yes | Excellent color; flat screen. | Heavy; perplexing one-button interface. |
| 2,048 × 1,536 | VGA/VGA | no | Small dot pitch; flat screen; multiple host inputs. | Soft text; purity problems. |
| 1,920 × 1,440 | VGA/VGA | no | Very black screen; very small footprint; multiple host inputs. | Missing shadow detail; curved screen. |
| 1,920 × 1,440 | VGA/8NC | no | Very good uniformity. | Moderately difficult OSD; curved screen. |
| 1,920 × 1,440 | VGA/8NC | yes | Very small footprint; multiple host inputs. | Soft text; curved screen. |
| 2,048 × 1,536 | VGA/VGA | no | Excellent color; flat screen; multiple host inputs. | No USB support. |
| 2,048 × 1,536 | VGA/8NC | yes | Exceptional color and text; USB hub; flat screen; multiple host inputs. | Expensive. |
| 2,048 × 1,536 | VGA/BNC | yes | Good uniformity. | No purity controls; curved screen. |

screen CRTs that alleviate many of those problems; placing a hood around the top and sides of your monitor, for example, can also help prevent glare.

LCD Monitors

Flat-panel displays are popping up everywhere these days. They're small, light, and stylish, and they provide flicker-free text. But they're relatively expensive, they don't display color

accurately, and when viewed from the side, they can distort a picture's color and contrast.

How They Work A flat-panel display employs a complex sandwich of glass and tiny electronic switches to create images. Small lightbulbs, called backlights, shine light through a series of glass sheets, polarizing filters, controlling electronics, and a transparent liquid-crystal medium. A thin-film transistor (TFT) layer twists, or

switches, the liquid crystals, blocking light passing through these layers. The TFT can control, or *address*, the light in minuscule dots, called cells. Each set of three cells, using the familiar RGB filter, makes up one color pixel.

Unlike CRTs, LCDs are digital devices. While CRTs take an analog signal that has been converted from digital by your Mac's graphics card, LCDs can accept and display a pure *continues*

BIGGER ISN'T ALWAYS BETTER

FOR MANY PEOPLE, A 19-INCH MONITOR occupies the sweet spot between stylish-yet-pricey LCDs and bulky 21-inch CRTs. It gives you more screen area in about the same desktop footprint as a 17-inch monitor, it's easy on the wallet, and it won't give you a hernia when you cart it up the stairs.

We evaluated 13 CRT monitors in the 19-inch category (see "37 Displays Compared") and determined that almost all of them were acceptable for everyday work. The \$279 Samsung SyncMaster 955DF, with its flat shadow-mask screen, is a great value. We chose the \$530 Sony CPD-G420S as our winner, however, for its crisp details and uniform screen.



Now Screening

All but three of the monitors tested employ the flat-screen aperture-grille technology found in Sony's popular Trinitron TV sets. To put the monitors on more of an even footing for testing, we adjusted each one to match 6,500 degrees Kelvin, the industry-standard color temperature used in color proofing. While many of the monitors have a built-in 6,500-Kelvin setting, only the Iiyama Vision Master Pro 451's built-in setting matched what we measured. The CTX PR960FL was the only model we weren't able to adjust to 6,500 degrees—it doesn't offer color-temperature control. This calibration process set each monitor to its optimum brightness and contrast, and

they all looked great and delivered sufficient detail to do the job. We found that both of the Sony monitors had marginally better shadow detail than the others, with the Hewlett-Packard P920 the worst in terms of shadow detail loss and images on the Philips Brilliance 109P appearing dull and washed out.

Fair and Square

Switching resolution generally requires readjusting your monitor's controls to get the image aligned properly again. To check this, we plugged each monitor into a Mac running Mac OS X 10.1 and switched it through all the available screen modes. Only the

Sony CPD-G420S and the ViewSonic P95f were able to automatically adjust to the changed input signal without leaving the menu bar off the screen. After switching the Vision Master Pro 451 to an unsupported mode, we were left staring at a black screen. There's normally a communication system between the monitor and display card that prevents this from happening, but it seemed to be missing from the Iiyama we tested.

That's a Moiré

When looking at a colorful image on screen, you may not see any discernible pattern or background noise in the display, but these moiré patterns are often there. To check this, we set each monitor's desktop pattern to a solid gray—a worst-case image that was very telling. The Samsung SyncMaster 955DF had the least amount of moiré pattern, and both the Eizo FlexScan F730 and the Brilliance 109P had a visible moiré but were jitter free. The worst were the Vision Master Pro 451, which showed wide grains

of moiré coupled with noise, and the CTX PR960FL, which had more pronounced noise. Most of the monitors include controls for canceling the moiré, and we were able to get the Samsung SyncMaster 900NF to have less of a wood-grain appearance. The CPD-G420S's control enabled us to reduce the moiré on the left side of the screen. Moiré controls are a bit of a double-edged sword in that they tend to get rid of noise at the expense of image and text sharpness.

Throwing a Sharp Look

For many people, a monitor's main duty is to display text, and if it's fuzzy, your eyes will suffer. When we looked at the smaller point sizes in a Microsoft Word

Big and Beautiful

Macworld
LAB TEST

| ••• Excellent | MOUSE RATING | TEXT SHARPNESS | COLOR QUALITY | PHOTO DETAIL | SCREEN UNIFORMITY |
|------------------------------|--------------|----------------|---------------|--------------|-------------------|
| •• Acceptable | • Poor | | | | |
| CTX PR960FL | ★★★½ | ● | ●●● | ●● | ●●● |
| Eizo FlexScan F730 | ★★★ | ● | ●●● | ●● | ●● |
| Eizo FlexScan T765 | ★★★ | ●● | ●●● | ●● | ●●● |
| Hewlett-Packard P920 | ★★★ | ●● | ●●● | ●● | ●●● |
| Hitachi CM721F | ★★★ | ●● | ●●● | ●● | ● |
| Iiyama Vision Master Pro 451 | ★★★½ | ●● | ●●● | ●● | ●● |
| Mitsubishi Diamond Pro 920 | ★★★ | ●● | ●●● | ●● | ●●● |
| Philips Brilliance 109P | ★★★ | ●● | ●●● | ●● | ●●● |
| Samsung SyncMaster 900NF | ★★★ | ●● | ●●● | ●● | ●●● |
| Samsung SyncMaster 955DF | ★★★½ | ●●● | ●●● | ●● | ●● |
| Sony CPD-G420S | ★★★½ | ●● | ●●● | ●●● | ●●● |
| Sony HMD-A400/L | ★★★ | ●● | ●●● | ●●● | ●●● |
| ViewSonic P95f | ★★★ | ●● | ●●● | ●● | ●●● |

We conducted subjective tests and ranked quality as excellent, acceptable, or poor. We rated each monitor according to how well it displayed our Adobe Photoshop, Microsoft Word, and DisplayMate test images. We tested each monitor using a Power Mac G4/466 with DVI-equipped ATI Radeon graphics cards. We set displays to 1,280-by-1,024-pixel resolution at 85Hz with 24-bit color. We used a Gretag-Macbeth Spectrolino to calibrate each display to a target color temperature of 6,500 degrees Kelvin.—Macworld Lab testing by James Galbraith

document on the Hitachi CM721F, we found that details of serif fonts got lost and that text wasn't as black as on the others. Likewise, fine text on the FlexScan F730 was unclear: an s was indistinguishable from a 2 or a z. With the CTX PR960FL, the previously mentioned noise was visible to the point of distraction. The ViewSonic P95f was acceptable except that its strong moiré pattern manifested as a subtle variation in the color of black text against the white background—adjustments to the built-in focus didn't help. The SyncMaster 955DF seemed sharper and had better focus than the others. The CPD-G420S looked good, with fairly crisp text, but it also showed a little noise.

Purity of Essence

A monitor with good *uniformity* is able to display the same color in all areas of the screen. In normal operation, a monitor can become magnetized, resulting in discoloration. This was the case with the majority of these monitors, though a problem was often solved by using the monitor's degauss control. If that doesn't do the trick, you may have to resort to adjusting the monitor purity or landing controls (some monitors use different terminology for the same thing), which usually affect specific portions of the screen. The Brilliance 109P had purity problems in its upper right corner that were easily fixed using the on-screen controls, while both the ViewSonic P95f and the CPD-G420S had pinkish areas visible in a red screen that were fixed by degaussing. The Hitachi CM721F showed some cyan-mottled areas in its lower left corner; the degaussing control helped reduce them but didn't eliminate them. Because this was the only monitor to show problems in colors other than solid red, it earned a poor uniformity rating.

Out of Whack

Unless you're able to buy the same monitor you examined at the store and can then gingerly carry it home, there's no guarantee that the monitor you end up with won't have some misalignment as a result of shipping. While bulkier tube models are likely more of a problem, no monitor is immune from turbulence that can occur during shipment—for example, the Sony HMD-A400/L review unit we received had a geometry problem that couldn't be corrected, possibly the result of repeated trips around the country.

Permanent damage notwithstanding, we had to play with the geometry controls of most of the moni-

tors to get the bows and bends out of the image. That required using the on-screen display (OSD), which is a pop-up control panel in the middle of the screen. On most monitors, it's accessed via a row of buttons on the front. The two Eizo monitors and the Sony HMD-A400/L use a single button that took some getting used to. Our favorite OSDs were on both of the Samsungs and the ViewSonic P95f, all of which feature a dedicated "exit" button—so you don't need to wait for the OSD to disappear by itself. Our least favorite OSD was the Hitachi CM721F's; it relied on vague icons to convey information, not icons with text descriptions like the other OSDs.

Macworld's Buying Advice

Many of the monitors we tested would do very well in your home or office, but the \$279 Samsung SyncMaster 955DF's crisp text and few problems make it an especially good value. For its higher-quality images with great detail and higher resolution, however, we give the nod to the \$530 Sony CPD-G420S, which costs \$159 less than the comparable Eizo FlexScan T765.—JEFF MILSTEAD

EDITORS' CHOICE

★★★½ **Sony CPD-G420S** This monitor's excellent details and stellar uniformity make it worth its relatively high price. **Company:** Sony (800/571-7669, www.sony.com)
Company's estimated price: \$530

While CRTs take an analog signal that has been converted from digital by your Mac's graphics card, LCDs can accept and display a pure digital signal.

digital signal. Each pixel (or subpixel) is addressable by your Mac without analog-to-digital conversion, but only if the monitor provides a digital interface. Most early flat-panel displays came with only a standard analog interface, but many current flat panels come with the standard VGA connector, as well as a digital interface known as DVI. Recent Power Mac models use a proprietary plug called the Apple Display Connector, which also supplies power and USB connectivity to the monitor.

Pros and Cons The first thing you notice about LCDs is that they're much smaller than CRTs, allowing you to use them in tighter spaces—often where CRTs wouldn't even fit—and taking up less precious desktop real estate. They're also considerably lighter, making them much easier to move, adjust, or even ship. LCDs in the 17- and 19-inch range weigh only 10 to 20 pounds. That size difference affects things such as energy use: a CRT uses a lot of energy (anyone who's watched a cat sleep atop a warm CRT already knows this). The typical 19-inch CRT monitor consumes 140 watts, while a 17-inch

LCD has a maximum power consumption of about 38 watts—only slightly more than what a resting CRT uses.

Flat panels are much easier on the eyes than CRTs, as the tiny cells allow for extremely crisp edges around text and graphics—an LCD's most attractive feature. In addition, images are steady and free of flicker because the pixels are constantly illuminated. Your eyes don't have to do extra work to assemble the picture.

The number of cells in an LCD is staggering—it's the display's maximum resolution multiplied by three (for example, $1,024 \times 768 \times 3 = 2,359,296$)—however, all of these pixels don't always work correctly together. This is especially true of larger screens with high resolutions. Some cells get stuck in the dark (black) state, while others remain in their native state—with light passing constantly through the glass. While most people view such cells—also known as *dead pixels*—as defects, vendors consider them a standard by-product of the manufacturing process, especially for screens larger than 15 inches. A screen with even

a handful of bad cells is deemed sellable, and the faulty cells are not covered by warranties.

Some people can ignore a bad cell or two, depending on their eyesight, their choice of background pattern, and the applications they use. If such defects bother you, an LCD might not be a good choice.

A flat panel's color depends on the performance of the backlight, or in a desktop display, an array of backlights. The light comes from long, thin fluorescent tubes, which over time can vary their output, creating areas of the screen with lighter or darker colors. As LCD manufacturers increase saturation with thicker color filters, the overall amount of light passing through displays is being reduced. Even though today's LCDs are usually brighter than CRTs (making them useful in situations with high ambient light), most LCD screens on the market provide only 40 to 65 percent of the colors available from any new CRT, even an iMac's built-in screen. They don't give you the dark, saturated colors that a CRT does, though they do produce brighter pastels. If you care about color, you'll probably

17-INCH LCDS (CONTINUED)



ViewSonic
VE170
ViewPanel



ViewSonic
VG175
ViewPanel

19-INCH CRTS



CTX
PR960FL



Eizo
FlexScan
F730



Eizo
FlexScan
F765



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notice. Notebook screens provide the fewest colors; some desktop displays use more-powerful backlights to increase color saturation.

Another critical problem of flat-panel displays is viewing angle. When viewed straight on, the on-screen image looks fine. However, when the LCD is viewed from the side, colors shift and contrast increases until the image almost disappears. The liquid-crystal material's refraction characteristics change depending on the orientation of the crystals, the light source, and the polarization layer.

Flat-panel displays are also less flexible in the resolution department, which comes into play when you want to view many palettes at the same time (higher resolution) or read larger text (lower resolution), for example. Each LCD has a native resolution, most often its maximum, and that's where it works best. It gets into trouble, however, when it's called upon to provide a lower resolution. Instead of filling the screen with the requested lower-resolution desktop, some flat panels place a smaller image in the middle of the screen, surrounded by a black frame. Many desktop LCD monitors now use better algorithms to scale and expand images—and although the process works better on some images, such as digital photographs, the results are often unsatisfying. Text becomes blurry, and lines (such as those in illustrations) can be fuzzy and jagged.

Another big drawback is cost. Although prices have come down,

LCDs are relatively new and therefore relatively expensive. A typical 17-inch LCD will cost between \$700 and \$1,000—far more than a CRT with a larger screen.

Finding the Perfect Monitor

Now that you understand more about how CRTs and LCDs work—and the qualities inherent in each type of monitor—you are ready to choose a model. Perhaps the most prominent attribute of a good monitor is also the most subjective: how it looks to you. Though this is something you can tell for certain only after a monitor is set up and connected to your Mac, there are things to look for in the product specs that can help you make your decision. When shopping for a display, you should concentrate on the feature set you need.

Choosing Your CRT Monitor

If you've decided to go with a CRT monitor, there are several things you should consider.

Size and Weight Since CRTs are large and heavy, first consider where you plan to use it. How big is your desk? How much weight can it hold? Will your monitor be staying in one place, or will you need to move it a lot? Size also becomes an issue if you need to ship your monitor to the manufacturer for repairs. A beefy 21-

inch monitor can weigh more than 100 pounds in its shipping carton.

Screen Monitor screens are measured diagonally, but vendors of CRT screens have traditionally measured the entire face of the tube, even parts hidden under the front bezel. Their actual viewable area is always smaller than the manufacturer's stated measurement by an inch or so; you should check out the viewable size before making a decision.

Glare Many CRTs now have flat tubes, a big advantage if you want to reduce glare.

Some also have special coatings on the glass surface for that purpose. Look in the specs for "flat screen" or "flat CRT" if this is important to you.

Resolution Being able to switch from one resolution to another is a big advantage of having a CRT. If you want to be able to see two pages of text side by side, large spreadsheets, whole Web pages, or large images, or if you simply want to have more screen real estate (albeit with smaller images and text), pick a monitor with a high maximum resolution. Since there's usually a difference between a monitor's maximum stated resolution and its real-world, usable resolution, shoot for the stars. Remember, your graphics card needs to support the higher resolutions—all continues



Hitachi
CM721F



Iiyama
Vision Master
Pro 451



Mitsubishi
Diamond Pro
920



Philips
Brilliance
109P



Samsung
SyncMaster
900NF



Samsung
SyncMaster
955DF

LARGER THAN LIFE

MANY OF US LOVE SITTING IN FRONT of a large CRT monitor—we favor grand images with rich colors, and we're swayed by an expansive virtual desktop capable of displaying dozens of files.

Even though the prices for comparable large flat-panel displays continue to fall, it's impossible for any LCD to beat a 21-inch CRT for value and color performance. Current street prices for comparable 20-inch flat panels hover at around \$3,000, whereas the nine 21-inch CRTs we looked at cost between \$499 and \$1,699 (see "37 Displays Compared"). All are acceptable for everyday use—and offer a wider color gamut and higher resolutions than flat panels—but Sony's \$799 CPD-G520 provides the best quality and features for a very reasonable price.

pick up annoying reflections, but we didn't find that curved screens detracted from image quality. Four of the displays in this roundup—the Vision Master 505, KDS VS-21e, Philips Brilliance 201B, and ViewSonic P225—were not flat. Iiyama and Philips use "flat square" technology, which is less curved than standard shadow-mask displays but not perfectly flat.

All these monitors worked fine with Mac OS 9.2 and Mac OS X 10.1. And conveniently, the model names of most of the displays are provided—along with a list of recommended resolutions—in the Monitor control panel and control strip. In our tests, however, for both the CTX PR1400F and the Vision Master 505, there was only a generic "Display #" readout.

The Eye of the Beholder

In our text tests, the Sony GDM-F520 was the best performer, maintaining a very legible and stable image even with small black-and-white text, due in part to its 0.22mm aperture grille. (Don't rely too heavily on specs—the Hitachi CM823F, with the finest dot pitch of the group, achieved only an acceptable rating in our text-sharpness test.) Even at 1,600-by-1,200-dpi resolution, 10-point type was still readable. The GDM-F520 also had excellent reproduction of color details in both shadows and bright areas of our test images.

Two other monitors also stood out from the pack: the Eizo FlexScan T962 and the Sony CPD-G520. The FlexScan T962 provided top-notch detail for both text and shadow colors. The CPD-G520 offered good text and a bright, pleasing image, without washing out highlight details.

The rest of the monitors provided acceptable performance for both color and text applications, but text was slightly jittery on the CTX PR1400F and appeared somewhat soft on the Hitachi CM823F.

Pure Thoughts

When one or more of the electron guns in a CRT become misaligned, its beam can hit nearby phosphor dots of another color, introducing color errors. Other problems can crop up when portions of the screen become magnetized. We needed to adjust colors on most of the monitors we tested. The Sony



The Sony CPD-G520

Thinking Big

Although all the displays we looked at are quite bulky, some are more compact than others. The Philips Brilliance 201B had the smallest front-to-back footprint in the group, and the Iiyama Vision Master 505 took up a similar amount of space but weighed 10 fewer pounds. On the other hand, the heavyweight of the group was the CTX PR1400F, which tipped the scales at almost 84 pounds—a third more than the Vision Master.

The need for a flat screen is a matter of personal preference. A curved screen can more easily

Large and in Charge

Macworld
LAB TEST

| | ••• Excellent •• Acceptable • Poor | MOUSE RATING | TEXT SHARPNESS | COLOR QUALITY | PHOTO DETAIL | SCREEN UNIFORMITY |
|--------------------------|--|--------------|----------------|---------------|--------------|-------------------|
| CTX PR1400F | •••½ | •• | ••• | •• | •• | ••• |
| Eizo FlexScan T962 | •••• | ••• | ••• | ••• | ••• | ••• |
| Hitachi CM823F | ••• | •• | ••• | •• | •• | ••• |
| Iiyama Vision Master 505 | ••• | •• | ••• | •• | •• | ••• |
| KDS VS-21e | •••½ | •• | ••• | •• | •• | ••• |
| Philips Brilliance 201B | ••• | •• | ••• | •• | •• | •• |
| Sony CPD-G520 | •••• | ••• | ••• | ••• | ••• | ••• |
| Sony GDM-F520 | •••• | ••• | ••• | ••• | ••• | ••• |
| ViewSonic P225 | ••• | •• | ••• | ••• | ••• | ••• |

We conducted subjective tests and ranked quality as excellent, acceptable, or poor. We rated each monitor according to how well it displayed our Adobe Photoshop, Microsoft Word, and DisplayMate test images. We tested each monitor using a Power Mac G4/466 with DVI-equipped ATI Radeon graphics cards. We set displays to 1,280-by-1,024-pixel resolution at 85Hz with 24-bit color. We used a Gretag-Macbeth Spectrolino to calibrate each display to a target color temperature of 6,500 degrees Kelvin.—**Macworld Lab testing by James Galbraith**

All the Trimmings

Some monitors offer amenities such as easy sharing between two computers, usually a Mac and a PC. The Hitachi CM823F, Sony CPD-G520, CTX PR1400F, and Iiyama Vision Master 505 have a pair of VGA ports and a button on the front panel to switch between two CPUs. The other monitors have BNC and VGA ports, as well as the requisite switch on the monitor's front panel.

Unlike some of the 19-inch monitors reviewed, however, none of the 21-inch models came with speakers, and five of the monitors support USB.

Macworld's Buying Advice

After comparing features and evaluating the displays with both productivity and graphics applications, we found that Sony's GDM-F520 provided the best overall performance. It also proves the old adage that you get what you pay for—the display has the highest price of the group.

For the best value, however, none could beat Sony's \$799 CPD-G520. It offers solid image performance and beautiful text display, and it comes with many of the OSD and purity controls of its higher-priced cousin.—DAVID MORGESTERN

EDITORS' CHOICE

••• Sony CPD-G520 At almost half the price of the other 21-inch Sony model we reviewed, the CPD-G520 combines great image and text quality with powerful, easy-to-use controls. **Company:** Sony (800/571-7669, www.sony.com) **Company's estimated price:** \$799

GDM-F520 had the best white uniformity and created a solid black; a slight red purity disturbance in one corner was easily fixed.

The Vision Master 505 provided the blackest black of the bunch, and the KDS VS-21e had a white uniformity close to that of the Sony GDM-F520. The Hitachi CM823F, on the other hand, had small splotches in the red test that refused to go away entirely even after several tries with the degaussing button; we had a similar experience in the blue test with the Philips Brilliance 201B and in the white test with the ViewSonic P225, which doesn't have controls to fix the problem.

Some of the monitors provide controls for adjusting color purity in their on-screen displays (OSDs), though naming conventions vary. The CTX PR1400F conveniently offers purity controls for the four corners as well as for the entire image. Other models provide controls only over the four corners; these include the Vision Master 505 (for which it's called *raster rotation*), FlexScan T962 (purity), and Sony CPD-G520 and GDM-F520 (landing).

Right on the Button

Monitor engineers often ignore the OSD's usability—a pity since the feature is needed to regulate colors over the life of the display, as well as for visual color calibration. The OSD interface has two parts: the external buttons and the readout on the screen. The hardware buttons are often assigned confusing labels, such as "+" or "-" (or "right" and "left," if the cursor moves through a menu on the screen).

Several displays offer intuitive sets of buttons—especially the Brilliance 201B, with its grouped buttons for moving up, down, and sideways through the OSD. We found the single toggle button on the FlexScan T962 and Sony CPD-G520 and GDM-F520 usable, although the GDM-F520's labels—the same color as the case—were difficult to read in a dimly lit room.

In addition, the front panel of the two Sony models in our roundup sports a Picture Effect button, which toggles through three preconfigured settings of brightness and contrast optimized for graphics and productivity applications. When available on other displays, the feature is usually buried deep in the OSD, making it inconvenient to use.

It's helpful to have a manual on hand when learning the details of the OSD. The Philips Brilliance 201B, however, comes with all its instructions and OSD guide on a CD-ROM—a troublesome predicament unless you have more than one monitor hooked up.

An LCD's viewable area is almost identical to its advertised size—a 17-inch LCD is comparable to a 19-inch CRT in terms of usable screen real estate.

the 21-inch monitors we looked at, for example, were capable of at least 1,600-by-1,200-pixel resolutions with an ATI Radeon PCI card.

Refresh Rate Since the image on a CRT is constantly being redrawn, the refresh rate may be important to you—especially if your eyes are particularly sensitive. A higher refresh rate at the resolutions you think you'll use can reduce flicker, which causes eyestrain and headaches. A rate between 75Hz and 85Hz should be fine, but remember that the higher the resolution, the less video memory (found on your graphics card) is left over for the refresh rate.

On-Screen Display If you can test a monitor before making a purchase, pay attention to the on-screen display, or OSD—the interface through which you control your monitor's performance. All monitors come with controls for positioning images on screen, but only some offer advanced color controls for purity and convergence problems; look for those if you need such control. Also watch for the placement (or absence) of buttons on the front panel. These controls provide access to OSD settings and frequently used

functions, such as degaussing. The easier it is to access a function, the likelier you are to use it.

Added Features All CRTs are analog monitors and therefore connect to your computer via the standard VGA connector. However, some monitors have dual VGA inputs, allowing you to share your display between two computers. Though this could save you money if you have two Macs side by side, dual VGA inputs are most commonly used to connect a monitor to both a Mac and a Windows PC—if, for example, you sometimes need to use a PC to test cross-platform Web sites. For this reason, a dual VGA connector may be a monitor's most important feature—because without one, you'll have to buy a stand-alone switch, at additional cost and hassle.

Many CRTs also have built-in USB hubs and speakers, sometimes at an extra cost. Although this may sound tempting, USB hubs are an inexpensive

add-on, and external speaker systems will provide much better sound.

Choosing Your LCD Monitor

If you've decided to purchase a flat panel, consider the following factors.

Price As manufacturers have improved production techniques, the prices for flat panels have dropped, while CRT costs have remained stable. (Just a year ago, many 15-inch flat-panel displays cost well more than the top-priced 17-inch models in

this roundup.) However, LCDs are still much more expensive than CRTs—larger LCDs, such as the 22-inch Apple Cinema Display, may cost more than your computer. If you have your heart set on an LCD, shop around online for the best price.

Size An LCD's viewable area is almost identical to its advertised size—a 17-inch LCD is comparable to a 19-inch CRT in terms of usable screen real estate. So when you decide how much screen space you



19-INCH CRTS (CONTINUED)



Sony
CPD-G420S



Sony
HMD-A400/L



ViewSonic
P95f

21-INCH CRTS



CTX
PR1400F



Eizo
FlexScan
T962



Hitachi
CM823F

want, you don't need to overestimate, as you do with a CRT.

Connections Because LCDs use varying types of connectors, first check your computer's graphics card to see what you can support. If your card has only a VGA connector, for example, you won't get any of the digital benefits of a flat panel—although with an investment of a few hundred dollars, you can make the switch to digital (see *Reviews*, March 2001, for more information on graphics cards). If you have a newer Power Mac G4, chances are you have a video card with either DVI or ADC connections (in addition to VGA). Pay attention to what you've got, since the two are not interchangeable. Currently, Apple and Formac are the only monitor vendors selling LCDs with ADC connectors, although you can purchase a converter that lets you use one technology with the other (see "Fifteen 17-Inch Flat-Panel Displays" for more details).

Resolution Because an LCD looks best at its native resolution, you're stuck with that resolution for day-to-day use; be sure to pick an LCD with a resolution that best suits your needs. This may require buying a slightly larger panel than you had planned.

The Last Word

No Mac is an island—without a way to interact with your computer, it is useless. You must have a monitor, and you should have the one that best suits your needs, surroundings, and

4 QUESTIONS TO ASK YOURSELF

No two people are alike, and the same can be said of displays. It's important to match your needs with the features and capabilities of a monitor. If you're like most people, your monitor will probably outlast your current Mac, so make the choice a good one. Here are four questions to get you started:

How Will I Use My Monitor?

If color is important to you—if you work with images or view lots of multimedia content, for example—a CRT is essential. If flicker-free text is more important, or if you have a form of color blindness, an LCD may be the way to go.

Where Will I Put My Monitor?

Remember that a CRT is big and heavy. Look at your workspace and decide what you will do there before you start looking at the biggest monitors around. Be sure your desk is sturdy enough to hold your monitor. If size and space are your biggest concerns—if you need room for your mouse, keyboard, and external devices on your desk—an LCD may be perfect for you.

How Will I Connect to My Mac?

Connecting a CRT monitor to a modern Mac poses few problems, although some older models may need a video-port adapter. The same seamless connectivity may be more difficult to come by with flat panels. Current Power Mac G4 models using an Apple Display Connector (ADC) will need a DVI-to-ADC converter to connect with some LCDs. And older Macs will likely need a new video card that provides a digital interface.

Will I Need to Change Resolutions?

If you work with image or multimedia applications—anything that has lots of palettes and menus—or design large Web pages, you'll probably want to have a high-resolution monitor to get the most on screen at once. However, you'll want to be able to switch to a lower resolution to read text at a legible size. And if you test or play games, you'll need to make sure you can switch to a lower resolution to get acceptable frame rates and screen redraws. A CRT will give you many more options for changing resolution.

pocketbook. Armed with this guide, you can decide on the technology, and the particular display, that's best for your lifestyle. **m**

DAVID MORGENSTERN is a former editor of *MacWeek* and a monitor expert. Associate

Editor JONATHAN SEFF has worked on several monitor stories.

More Info: www.macworld.com/subject/monitors

Check out everything monitor-related, including display reviews.



Iiyama
Vision Master
505



KDS
VS-21e



Philips
Brilliance
201B



Sony
CPD-G520



Sony
GDM-F520



ViewSonic
P225

7 Night Alaskan Cruise – May 27 to June 3, 2002

MacMania

Chart a Course to Adventure

Discover the Majestic Beauty of Alaska
Sail the Scenic "Inside Passage" on
Holland America's 5-star m.s.Volendam

A VACATION FOR MAC LOVERS

Just being on a luxurious cruise ship in Alaska is enough of an experience for most people. But as you watch the glories of nature pass by — mammoth glaciers, pristine wilderness, soaring eagles — you realize that something else is making this the best vacation you've ever had: hours of Mac seminars, conducted by top people, attended by like-minded enthusiasts. This is the life: relaxation for the body, stimulation for the mind.

Forget about boring vacations! Ride a dog sled, fly over fjords, take a quick course in canoeing. Then settle into one of MacMania's many fascinating seminars where you can learn new skills and share ideas.

Sailing on Holland America Line is a delightful adventure in itself. "Highest rated premium cruise line," say readers of Conde Nast

Traveler and Travel + Leisure. "Diamond Awards: Food Service, Entertainment & Onboard Service," says Onboard Services Magazine. "Best overall cruise value," says World Ocean and Cruise Line Society.

THE GEEK CRUISE DIFFERENCE

MacMania is a conference like none other you've ever attended. You'll have a large selection of seminars to choose from, presented by people who really know and understand Macs. You'll also spend seven days in one of the most scenic places in the world, sharing ideas around-the-clock with fellow Mac users, talking one-on-one with top leaders in the field.

And while you're enjoying Mac stuff, your family and friends will be enjoying life aboard a fabulous cruise ship, playing, relaxing, and taking in the sights.

When was the last time you acted on a dream? It's time.



END-USERS

End-User conference attendees may choose any combination of full-day, half-day, or quarter-day seminars for a total of two-and-a-half (2.5) days' worth of sessions. The conference fee is \$600 and includes all courses, course materials, and the Bon Voyage and Wizard's Cocktail Parties.

GRAPHIC ARTS

What's New? (half day)
OS X! Illustrator 10! Photoshop ??!

Speaker: Deke McClelland

Now that Adobe has announced Illustrator 10, Carbonized for OS X, can Photoshop be far behind? Regardless of the answer, Deke will be there to fill you in. Learn how to make the most of the latest and greatest features in Illustrator 10 and Photoshop ?? — whatever it may be.

Macintosh Studio Secrets (half day)

Speaker: Deke McClelland

Based on Deke's Computer Press Award-winning book, *Photoshop Studio Secrets*, this exciting class examines a collection of dazzling techniques employed by some of the most prominent artists working in Photoshop today. As an added bonus, Deke will also examine techniques used in the creation of his newest full-color book, *Adobe Master Class: The Art of Design*, which explores how seven artists created an advertising campaign for Adobe using a host of applications including Illustrator, InDesign, Live Motion, and others. Top-secret fact: out of 30 artists interviewed for the two books, 29 use Macs. Transcend the mere mastery of a single application and gain insight into the larger world of Macintosh art.

iMovie 2: the Missing Crash Course (quarter day)

Speaker: David Pogue

New York Times columnist David Pogue takes video lovers on the ultimate immersion course based on his bestselling book *iMovie 2: The Missing Manual*. In the fast, funny space of these one-and-a-half hours, Pogue, with the audience's assistance, will actually produce and edit a full-fledged movie — with plot, characters, music, effects, and, of course, technical workarounds — that will teach you not just about iMovie and your camcorder, but the Hollywood techniques that separate amateur camcorder and production work from polished, professional efforts.

Macworld
THE MAC PRODUCT EXPERTS

 geekcruises.com
EDUCATION THAT TAKES YOU PLACES

Digital Video Postproduction and Special Effects (half day)

Speaker: Ben Long

Participants in this class will learn the basics of common special effects processes such as compositing, rotoscoping, and color correction. These are the fundamental techniques that are used for almost all types of special effects work. In addition to learning how to matte one element into another, students will learn how to digitally stabilize shaky footage, paint new elements into existing footage, remove wires and artifacts, utilize special effects filters, and correct bad color. Compositing lessons will cover alpha channel compositing as well as blue-screen keying. Students will learn the basics of Adobe After Effects and Pinnacle Commotion, as well as learning how to work with media from other applications such as 3D animation packages and Adobe Photoshop. Finally, this course will cover the myriad of workflow and compression issues that arise when moving between your editing and special effects programs.

Alaska Digital Camera Workshop (two days)

Speakers: Rick LePage and Ben Long

This two-day workshop will cover the latest digital camera and printing technology in a fun and unique hands-on laboratory environment. Join us on the first day as we show you the latest 3-, 4- and 5-megapixel digital cameras. We'll cover the pros and cons of these mini marvels and offer tips and tricks for getting the best out of your camera. At the end of the first session, we'll set you loose with a camera to go shooting on the ship or in the Alaskan wilderness. The second day will focus on helping you get the best prints possible from your digital images. We'll take your pictures and show you the best ways for manipulating them in Photoshop, and then, using the latest inkjet printers from Canon, Epson and HP, we'll show you how to make those images look better than traditional photographs, and give you the opportunity to test out a number of different printers with your own images. We'll also include tips for unique software tools to enhance your pictures, and some recommendations for software that will let you find those images long after you've shot them.

EVENT SCHEDULE

Bon Voyage Cocktail Party

Monday, May 27, 7:15pm – 8pm

Guru Session with Deke McClellan

Tuesday, May 28, Noon – 1:30pm (Lunch)

David Pogue Live!

Tuesday, May 28, 6pm – 7:15pm

Dramatic Reading of the bawdy *The Devil And Billy Markham*

John de Lanie

Tuesday, May 28, 10pm – 11:30pm



PRODUCTIVITY

Cutting the Cord (half day)

Speakers: Glenn Fleishman and Adam Engst

Wireless Ethernet (known as AirPort, Wi-Fi, or IEEE 802.11b) is zesting up the airwaves by easily connecting Macs (and PCs), PDAs, and other devices to one another and to the Internet over high-speed wireless networks. In our session, we'll give an overview of the technology; cover tactical issues of using wireless networks in airports and coffee shops; discuss security concerns and solutions; demonstrate networking equipment from Apple, Palm, and others (with a sneak peak at a Wi-Fi phone); look at using antennas to extend the wireless range significantly; talk about the free public wireless networks popping up; and of course, do fun Mac tricks like sucking JPEGs out of the air.

You will learn:

- basic technology and terminology
- planning and implementing a wireless network
- overcoming security flaws through simple tunneled sessions
- using wireless networks away from your home or office
- the realities of long-range wireless connections

Best of "Mac Secrets" (half day)

Speaker: David Pogue

Join this highly entertaining session as David Pogue makes the Macintosh operating system sing, dance, and stand on its head. This session gives away the best of the bestselling *Macworld Mac Secrets, 6th Edition*. Witness a parade of undocumented Easter eggs, learn to make useful AppleScripts in 30 seconds, double Web browser speed, protect documents from prying eyes, send file attachments intact to Windows email programs, and much more. Special focus on the tips, tricks, and secrets of Mac OS X.

Guru Session with Adam Engst

Wednesday, May 29, Noon – 1:30pm (Lunch)

Pundits Panel

Thursday, May 30, 6pm – 7:30pm

Guru Session with Bob LeVitus

Friday, May 31, Noon – 1:30pm (Lunch)

The Creative Mac Maniac David Biedny

Friday, May 31, 5:45pm – 7:45pm

Panel Discussion:

The Future of Mac Software

Saturday, June 1, 9am – 10am

Mac Jeopardy

Sunday, June 2, 5:30pm – 6:45pm

The Story of Apple II, Steve Wozniak

Sunday, June 2, 7pm – 8pm

SEMINARS

Tuesday, May 28,

8:30am – Noon & 1:30pm – 5pm

Wednesday, May 29,

8:30am – Noon – Noon

Friday, May 31,

1:30pm – 5pm

Sunday, June 2,

8:30am – Noon & 1:30pm – 5pm

MACMANIA SPEAKER PROFILES

David Biedny brings his deep technical involvement in the Macintosh platform and experience as one of the industry's leading digital technology experts to MacMania. David was one of the Founding Editors of MacUser magazine and is a widely published author. Many longtime industry players consider him to be one of the technical and creative pioneers of personal computer-based multimedia, having worked at Industrial Light & Magic, independently created digital special effects for motion pictures, and produced major multimedia projects and products for over 15 years. David is President and Technical Director of IDIG, Inc.

John de Lanie routinely works cross platform — the legitimate stage, film stages, television stages, the concert stage, the radio stage, and the planning stage. In matters of computing as an artist or businessman, however, he strictly adheres to the Mac OS.

John joins the faculty of MacMania to embody the creativity and discipline that are cornerstones of the Macintosh world. Indeed, he was the inspiration for MacMania.

Most of us know John primarily from his film work; from his numerous television appearances, including in his own series, "Legend"; from his stage performances; from his orchestral performances; from his co-creation, Alien Voices, a production company devoted to the dramatization of classic science fiction; and from his radio productions such as NPR's "Invasion from Mars" and the BBC's "Julius Caesar", among many others.

Paralleling his roles as actor/director/Renaissance man in the performing arts realm, John has served as Master of Ceremony at Macworld's annual Editor's Choice (Eddy) Awards in the Macintosh-centric universe, and joins us as MacMania's Muse.

Adam Engst is the publisher of TidBITS, one of the oldest and largest Internet-based newsletters, distributed weekly to hundreds of thousands of readers. He has written and co-authored numerous Internet books, including the bestselling *Internet Starter Kit* series, and many articles for magazines, including Macworld, where he is currently a Contributing Editor. His innovations include the creation of the first advertising program to support an Internet publication in 1992 and the first flat-rate SLIP accounts for graphical Internet access in 1993 (with Northwest Nexus for Internet Starter Kit for Macintosh). In addition, he has collaborated on several Internet educational videos and has appeared on a variety of internationally broadcast television and radio programs. His indefatigable support of the Macintosh community and commitment to operating at a personal level resulted in numerous awards and recognition at the highest levels. In the annual MDJ Power 25 survey of industry insiders, he ranked as the second (2000) and third (2001) most influential person in the Macintosh industry, and he was named one of MacDirectory's top ten visionaries. And how many industry figures can boast of being turned into an action figure?

SPEAKER PROFILES (CONTINUED)

Jesse Feiler is the author of a number of Mac OS X books including *Mac OS X: The Complete Reference*, *Mac OS X Developer's Guide*, and *Java Programming on Mac OS X*. He is also the author of *Building WebObjects 5 Applications*, as well as many books on the Web-based enterprise, the Y2K problem, home offices, databases, and File-Maker. His books on OpenDoc, Cyberdog, Apple Guide, and Rhapsody are now collector's items.

He has worked as a developer and manager for companies such as the Federal Reserve Bank of New York (monetary policy and bank supervision), Prodigy (early Web browser), Apple (information systems), New York State Department of Health (rabies and lead poisoning), The Johnson Company (office management), and Young & Rubicam (media planning and new product development).

Active in the community, he is President of the Mid-Hudson Library System, Chair of the Philmont Comprehensive Plan Board, and Treasurer of the HB Playwrights Foundation.

He lives 100 miles north of New York City in the Village of Philmont with a retired rescued greyhound and a cat. His research into iMovie, iDVD, and Image Capture has earned him the sobriquet "The Digital Scourge of Philmont."

Glenn Fleishman is the "Practical Mac" columnist for the Seattle Times, and contributes to The New York Times, Fortune magazine, Wired magazine, The Seattle Weekly, O'Reilly Networks Wireless DevCenter, and TidBITS. Glenn has written and contributed to several books, including co-authoring *Real World Scanning and Halftones*, and the two editions of *Real World Adobe GoLive*. He recently wrote the Internet Protocol chapter for *802.11 Unleashed* from Sams Publishing.

Glenn lives with an iMac and a dual-USB iBook. At work, he cohabitates with a G4 Cube with 1.5gb of RAM, and three Red Hat Linux boxes. Since October 2000, he has spent considerable time researching and writing about the spread of wireless 802.11b networking, including on his daily Web log 80211b.weblogger.com. His ongoing experiments in entrepreneurship can be found at isbn.nu, a service that's written entirely in Perl that compares prices for books at online stores.

Andy Gore is the former Vice President of Content/Editor in Chief of Mac Publishing, L.L.C. In this role, Gore was responsible for the development and management of content across Macworld magazine as well as the Mac Publishing Websites.

Andy has been writing about the Macintosh since the first 128K Mac hit the streets. With prior stints at MacWEEK and MacUser, Andy was appointed Editor-in-Chief of Macworld magazine in 1997 and VP of Content in 1999. Under his supervision, both Macworld magazine and Macworld.com have received "Maggie" awards for best publication in their respective categories by the Western Publications Association.

In addition to penning a monthly column, Andy has written several cover stories for Macworld as well as the best-selling book, *My iMac*. He is also the author of four other technology books.

(continued)

PRODUCTIVITY

Microsoft Office v.X Inside and Out (half day)

Speaker: Tom Negrino

Microsoft Office v.X for Mac OS X is an incredibly powerful suite, but its size and complexity make it difficult to master. Tom's class helps you meet the challenge of the four Office applications (Word, Entourage, Excel, and PowerPoint) by showing you the best ways to accomplish both simple and complicated tasks. You'll discover features of these programs that you never knew existed, and how to use these features to ease your work. Plus, you'll go home with a slew of useful tips and tricks!

Building Web Sites with Dreamweaver 4 and Fireworks 4 (half day)

Speaker: Tom Negrino

The Dreamweaver 4/Fireworks 4 Studio is the most powerful and popular way to create web sites on the Macintosh. With this suite, you can easily change from your artist hat to your Web-designer hat and back again, saving valuable production time as you move images and HTML between applications.

In this session, you'll learn how to:

- Use Fireworks 4 to create web graphics, hierarchical menus, and navigation bars
- Use Dreamweaver 4's site editor, templates, and unmatched tool set to build well-structured sites with room to grow
- Integrate the two programs to ease your workflow and speed your work

Eudora, Entourage, Mailsmith Shootout (half day)

Speakers: Adam Engst, Tom Negrino, and Neil Bauman

Lots of people use them, but relatively few realize all the truly cool things you can do with these packages. We'll look at the various high-end features each of these packages offer. By the end of the session, we'll have clearly labeled which package is king of the heap.

Mac Security and Encryption (quarter day)

Speaker: Glenn Fleishman

Paranoia is only a problem if people aren't watching you; recent history shows they are. Here is a variety of techniques for securing your machine and your content in OS 8, 9, and X.

We'll cover:

- using OpenDoor, Symantec, and similar software to shut down ports against pirates
- manning the crow's nest: identifying attacks and solving them (denial of service, ping of death, etc.)
- the captain's code: encrypting your email or even all data to prevent peeking in transit (especially important for wireless transmission) using PGP, SSL, and SSH tunneling
- OS X as a secure encryption/tunneling server with commercial software and freeware.

Web Site Power Tips (quarter-day)

Speaker: Jason Snell

The Mac's got plenty of great tools for making Web sites, but you need a good site-building strategy to go along with that software. This session will give you tips on building great sites by organizing your content effectively, creating useful and usable site navigation, testing site functionality, meeting accessibility standards, improving load times, and more. Plus we'll give you some great advice about powerful features within popular Mac site-building applications such as Dreamweaver, GoLive, and BBEdit.

Scripting Macromedia Dreamweaver and Fireworks (half day)

Speaker: Dori Smith

Dreamweaver and Fireworks are amazing tools, but what you get when you install them is just the beginning of their capabilities. Under the hood, they're built from HTML, JavaScript, and XML, so you can change and extend these products to be anything you can imagine.

This course will cover the internals of Dreamweaver and Fireworks, including how to make the programs work together. It will also cover how to use Macromedia's Extensions site to leverage the benefits of work that other people have already done.



USING OS X

Dr. Mac's "Getting Comfortable with Mac OS X" Workshop (half day)

Speaker: Bob LeVitus

Dr. Mac will show you all the things you need to know to become comfortable using OS X. This in-depth workshop will show you the ins and outs of installing OS X, tips and techniques for customizing it, using OS X with the Web, plus fine-tuning and troubleshooting OS X. You'll also look at useful commercial programs, and the great shareware and freeware that can enhance your OS X experience.

You will learn:

1. What OS 9 users need to know to use OS X.
2. Tips, techniques, and advice on using OS X.
3. How to have OS X and OS 9 coexist peacefully on the same computer.
4. How to configure OS X for best performance.
5. Shareware, freeware, and commercial programs and utilities that make OS X better.

Who should attend: People who want to learn everything you need to know to get up and running with OS X painlessly.

Dr. Mac's "Best of Mac OS X Shareware, Freeware, and Otherware" (quarter day)

Speaker: Bob LeVitus

Shareware, freeware, and otherware (e.g. beerware, postcardware, e-mailware) are all examples of freely-distributed software. Most of it isn't sold in stores, isn't packed in shrink-wrapped boxes, and doesn't include printed documentation. But don't let that fool you. There's gold in them there electrons and Dr. Mac has collected and evaluated thousands of freely-distributed OS X programs as he researched and wrote, *Dr. Mac: The OS X Files* (or *How to Become a Mac OS X Power User*) for Coriolis.

In this two hour session he'll show you the best and brightest non-commercial software available for Mac OS X today.

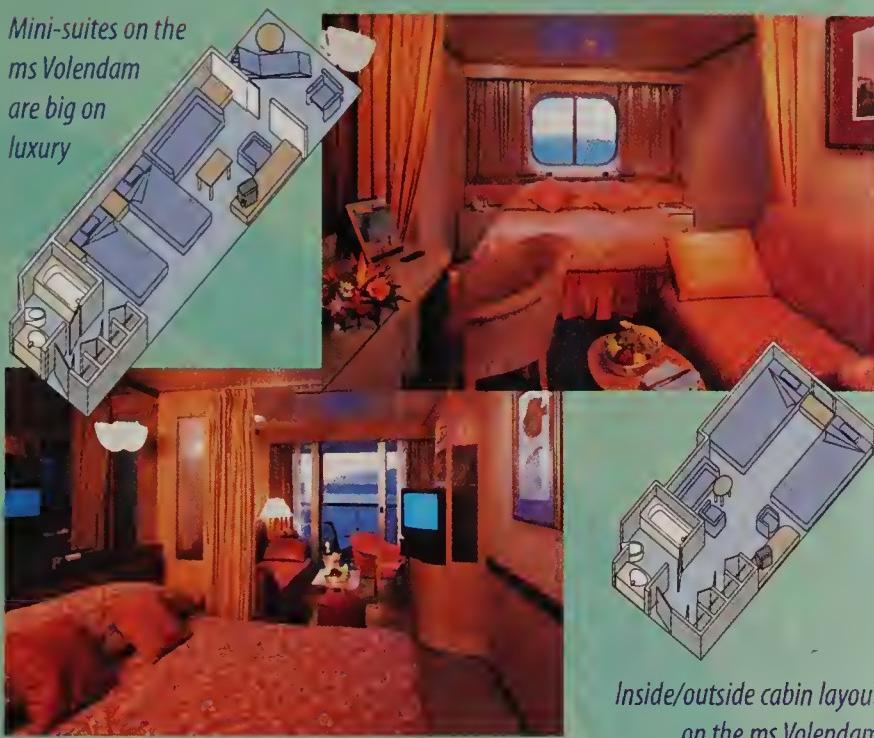
Among the highlights:

- Timesaving utilities for OS X.
- Programs that rival commercial software for far less money.
- Great games with low prices (some are even free).
- The top tools used by Mac OS X power users.
- Where to shop for shareware.

All delivered in Dr. Mac's trademark style (a mix of encyclopedic knowledge of Mac OS X's inner workings, bad jokes, and worse puns).

These seminars are subject to change. Additional, topical seminars may be offered as well. Attendees will be notified once our program is finalized. Courses with little interest may be cancelled.

Mini-suites on the ms Volendam are big on luxury



Inside/outside cabin layout on the ms Volendam

A UNIX Guide to OS X (full day)

Speaker: Randal Schwartz and Glenn Fleishman

For most hardcore Mac users, a "command prompt" is a strange world. However, with the introduction of UNIX into the core of Mac OS X, some tasks that were formerly hard are now quite easy, once you get the basics down about how to use that command line. In the first half of this full-day talk, learn from 24-year UNIX veteran Randal Schwartz (who has been using a Mac daily for the past 10 years) about the basics of UNIX commands, including common file and folder manipulation, automating repetitive tasks, and even accessing your machine remotely.

In the second portion of this seminar, for advanced Mac users, learn how to write Perl scripts, configuring software, installing packages, and having a blast customizing the terminal side of things.

You do not need any prior UNIX knowledge to benefit from this course.

Goin' Mobile with Mac OS X (half day)

Speaker: Andy Gore

Everyone's hittin' the road with Apple's hot-selling iBooks and PowerBooks. But the rules of the road are different for mobile Mac users than they are for those still tethered to the desktop: dealing with networking connections, file transfers, battery life, and just getting along miles away from support services. When you're on the road you're on your own.

What you'll learn:

- Mac OS 9 versus Mac OS X — How do they differ for the mobile Mac user?
- Taking Advantage of OS X's advantages as a portable OS.
- The best applications for mobile users
- Configuring OS X's Location Manager
- Best utilities for Mobile Macs
- Strategies for maximizing battery life
- Getting connected while on the road
- PowerBook and iBook triage — how to deal when disaster strikes
- The best gadgets and add-ons for the Mobile Mac

GLACIER BAY NATIONAL PARK

No one else shows you Glacier Bay like Holland America. Witness a world still emerging from the Ice Age — with its many diverse tide-water glaciers in action.



DEVELOPERS

Developer conference attendees may choose any combination of full-day, half-day, or quarter-day seminars (and may also choose from end-user seminars) for a total of two-and-a-half (2.5) days' worth of sessions. The conference fee is \$1,250 and includes all courses, course materials, and the Bon Voyage Cocktail Party.

AppleScript Crash Course (half day)

Speaker: Sal Soghoian

Sal Soghoian, noted AppleScript Guru, delivers a mini-crash course on AppleScript in Mac OS 10.1. Scripting experience is helpful but not required since numerous script examples are provided.

Topics include:

- Scripting the Finder
- Creating Toolbar scripts and droplets
- Using SOAP and XML-RPC to query Internet Web Services
- Scripting the applications included with Mac OS X:TextEdit, Internet Connect, Print Center, Terminal, etc.

This three-hour overview also includes an introduction to AppleScript Studio, Apple's innovative GUI development environment for creating Cocoa applications with AppleScript.

Now's the time! You don't know Mac OS X thoroughly until you've familiarized yourself with AppleScript!

Using Project Builder and Interface Builder (half day)

Speaker: Jesse Feiler

Project Builder and Interface Builder are Apple's primary development tools for Mac OS X. Powerful and complex, they provide far more than just editing and debugging features. We'll cover an overview of the tools, and tips on how to convert built-in templates into usable applications with a minimum of fuss.

We'll learn how to use the built-in Project Builder templates to create ready-to-use applications in Carbon, Cocoa, Java, WebObjects, and plain old C. Interface Builder provides a sophisticated way to design user interfaces and to connect the elements in them to data and functions written in Carbon, Cocoa or WebObjects. The Interface Builder templates help you design powerful interfaces, and these will also be described.

SPEAKER PROFILES (CONTINUED)

A sought-after speaker on all things Macintosh, this year Andy was asked by Apple Computer to represent them on an OS technology shoot-out with their competitors during Spring Comdex in Atlanta.

Andy is a regular on John Dvorak's "Silicon Spin" show on TechTV and, according to its producers, his latest appearance garnered the highest level of interactivity for this program yet.

Rick LePage has been writing about the Mac since its inception and, in 1985, co-founded the influential newsletter MacInTouch. He was with MacWEEK in various capacities for 10 years, ultimately as the Editor in Chief and Publisher. He currently is the Editor in Chief of Macworld magazine.

Bob LeVitus, often referred to as "Dr. Macintosh," has written 37 popular computer books, including *Mac OS X For Dummies* for Hungry Minds Books, *The Little iTunes Book*, for Peachpit Press, *Stupid Mac Tricks* and *Dr. Macintosh*, both for Addison-Wesley, as well as recent titles such as *Macworld Microsoft Office 2001 Bible* (with Dennis Cohen) and *Internet For iMacs For Dummies*, (with Natanya Pitts) both for Hungry Minds Books. His books have sold more than a million copies worldwide.

He is presently a syndicated newspaper columnist (Dr. Mac) for the Houston Chronicle, Austin American-Statesman, and several other newspapers. He's also been published in more than two-dozen computer magazines over the past fifteen years. A tireless publicity hound, Bob's achievements have been documented in major media around the world. He's known for his expertise, trademark humorous style, and ability to translate "techie" jargon into usable and fun advice for regular folks.

Bob is one of the world's leading authorities on the Mac OS. From 1989 to 1997 he was a contributing editor/columnist for MacUser magazine, writing the Help Folder, Beating the System, Personal Best, and Game Room columns at various times in his illustrious career. He was the host of Mac Today, a half-hour television show syndicated in over 100 markets, which aired in late 1992.

Deke McClelland, pioneering electronic publishing expert, is the author of *Macworld Photoshop 6 Bible* and *Photoshop 6 for Windows Bible* (both Hungry Minds), which represent the bestselling guides of any kind on digital imaging. Having written more than 60 titles in 20 languages with 3 million copies in print, Deke is one of the most award-winning writers in the business, including a total of seven honors from the Computer Press Association. In addition to designing and editing a new visual learning series called *Look & Learn* (Hungry Minds), Deke hosts the in-depth training videos *Total Photoshop*, *Total Illustrator*, and *Total GoLive* (all Total Training). He is a contributing editor for Macworld and Photoshop User magazines, and a member of the PhotoshopWorld Instructor Dream Team.

SPEAKER PROFILES (CONTINUED)

Tom Negrino is a book author and Contributing Editor to Macworld magazine. His latest book is *Microsoft Office v.X Inside Out*. Among his many other book titles, he co-authored the best-selling *JavaScript Visual Quickstart Guide, 4th Edition* and wrote *Quicken 2001 for Mac, Visual Quickstart Guide*. He began his writing career in 1985 with MacGuide magazine, joining the Macworld ranks in 1987. He is a frequent speaker at industry trade shows and conferences, and is a member of the Web Standards Project Steering Committee. He lives in Northern California's wine country.

In late 2000, after 13 years at Macworld magazine, triple-award-winning columnist **David Pogue** joined the New York Times, where he writes the weekly "State of the Art" personal-technology column.

With over two million books in print, Pogue is one of the world's bestselling how-to authors, having written or co-written six books in the "for Dummies" series (*Macs, iMacs, iBooks, Magic, Opero, and Classical Music*), *PalmPilot: The Ultimate Guide*, and six editions of *Macworld Mac SECRETS. The Missing Manual* series, a joint venture he created with publisher O'Reilly & Associates, now includes best-selling guides on Mac OS 9, iMovie 2, Office 2001, AppleWorks 6, Dreamweaver 4, and Mac OS X.

His computer students have included Mia Farrow, Carly Simon, Harry Connick Jr., Stephen Sondheim, Vanessa Redgrave, and other stars. He lives with his wife, son, and daughter in Connecticut, as copiously photographed at www.davidpogue.com.

Randal L. Schwartz is a two-decade software industry veteran — skilled in software design, system administration, security, technical writing, and training. He co-authored the "must-have" standards: *Programming Perl*, *Learning Perl*, *Learning Perl for Win32 Systems*, and *Effective Perl Programming*, as well as writing regular columns for *WebTechniques* and *UnixReview* magazines. Since 1985, Randal has owned and operated Stonehenge Consulting Services, Inc.

Dori Smith is co-author of the best-selling *JavaScript for the WWW, 4th Edition: Visual QuickStart Guide* and the author of *Java for the WWW: Visual QuickStart Guide*, both from Peachpit Press. She has also contributed to numerous computer industry magazines, including writing monthly columns for DevX and Macworld.com. In addition to writing, she has been programming for over twenty years, with degrees from UC Irvine and UC San Diego, and is a frequent speaker at industry conferences. She is also Publisher and ListMom for the Wise Women's Web organization, and is a member of the Web Standards Project Steering Committee.

Cocoa in Action (half day)

Speaker: **Jesse Feiler**

Apple's advanced application development framework, Cocoa is built on the long-standing legacy of NextStep and OpenStep. With programming interfaces in both Objective-C and Java, Cocoa is accessible to many programmers. This session focuses on the Cocoa class hierarchy as implemented in the Foundation and Application kits, and it shows you how to use the many default template projects in Project Builder. The focus is not on a simple "Hello World" type of application, but on the real-world types of projects that you need to write and implement — and extend.

Porting to Mac OS X (half day)

Speaker: **Jesse Feiler**

Unless you start from scratch, all Mac OS X development at the moment consists of porting—from Classic Mac OS, from C, from UNIX, from PowerPlant, from MacApp, or from Windows. Porting targets on Mac OS X include command line tools, Cocoa, Carbon, PowerPlant, MacApp, AppleScript, and modern productivity tools such as FileMaker.

Porting requires all the traditional programming skills and more: not only do you need to write code, but you need to read and understand the existing code that needs to be ported. This session helps you see the steps to be taken, and helps you match the various opportunities to your situation.

Java Development for Mac OS X (half day)

Speaker: **Daniel H. Steinberg**

Mac OS X is a great platform for Java developers to use and target. The UNIX foundation means that hard core Java programmers will find the command line tools they know and love. Not quite so hard core? Now that a Java 2 VM ships with every version of Mac OS X you'll be able to use your favorite Java based IDEs and open source tools on your Mac. This also means that your Java applications will run on Mac OS X without any changes. They'll look better and hardware acceleration means that most of your Swing apps will even run faster. In this session you'll look at making your Java applications more Mac-like when they run on Mac OS X. If you are specifically targeting the Mac, you'll see how to take advantage of Java enabled Apple technologies such as speech recognition and synthesis, spellchecking and QuickTime.

Learning Perl (full day)

Speaker: **Randal Schwartz**

This course is based on Randal's Popular O'Reilly Nutshell book, *Learning Perl*. The course presumes no prior knowledge of Perl, and exposes the course participants to what we call the "middle two-thirds" of Perl.

WebObjects S (half day)

Speaker: **Daniel H. Steinberg**

You want to create a more interesting web site with dynamic content. You're going to figure out how to get all of that information from the database to be nicely presented and then take user input and update the database. Sounds like a lot of work. Consider Apple's WebObjects before you buy an expensive solution or take the time to learn JSPs, Servlets, EJBs and JDBC. You'll still need to write code, but much of the setup work is done for you by the development tools. In this session, we'll quickly create and customize a dynamic web site from a database.

Introduction to Java on Mac OS X (half day)

Speaker: **Daniel H. Steinberg**

You have no interest in being a professional programmer but there's this application you'd like to try to write for your Mac. Friends of yours that are Windows users tell you that they use Visual Basic. You shudder and feel slightly sorry for them. Now that Apple ships Java on every Mac you have the perfect environment for playing around with writing programs for your Mac. In this session, you'll look at the free tools available for you to develop in the Java programming language. You'll see how to write a quick visual program and how to package it up to distribute a double clickable application.



PRICING AND BOOKING INFORMATION

Conference Fee: \$600 (End-User Track) or \$1,250 (Developer Track) per conference attendee. Only passengers booked through Geek Cruises will be admitted to MacMania.

Deposit: \$450 per person, due at time of booking.

| Cabin Type | Cruise Rate |
|----------------|----------------------------|
| Inside cabins | \$1,049 (GS* available) |
| Better inside | \$1,149 (GS* available) |
| Outside cabins | \$1,349 (GS*, & available) |
| Better outside | \$1,549 (GS*, & available) |
| Mini-suites | \$1,899 |

3rd and/or 4th Person Rate: 19 years old and older, \$649; ages 2 – 18, \$549; under 2 years old, \$449

Single Occupancy: 150% for inside and outside cabins and 200% for mini-suite and above.

Port Charges and Taxes: \$184 per person (subject to minor change).

Full payment is due on February 15, 2002 (or, if you book after February 15, at the time of booking).

Foreign Booking Fees and Additional Payment Information: There is a foreign booking charge of \$60 per foreign residence (\$35 per Canadian residence). There is a \$25 charge for returned checks.

Air Add-ons: Airfare from most major cities is available through the cruise line. You can call our office for this pricing. (These rates include transfers to/from the dock/airport plus transfers to/from your hotel if we've booked the hotel as well.) In most cases, however, you will find better airfares on your own. Online travel sites such as www.geekcruises.globaltravel.com, Expedia.com, or Travelzoo.com are excellent resources. Alternatively, if you prefer to book with a "real" person (and get the same rates available via the online services), we recommend GTI (800-715-4440 or 800-716-4440, agent PIN #54575) because of its 7-day a week office hours and their lowest-fare guaranteed service option ("Aircare Program").

Pre- and Post-Cruise Hotel Stays: Sightsee beautiful Vancouver! The hotel will be close to the dock. If we book your hotel, transfers from the hotel to the dock are included.

Physically challenged available

*Guaranteed Share (GS) Fares: This plan is for passengers who are coming on MacMania by themselves and wish to share a cabin with another MacMania passenger in an inside or outside cabin only. The prices are the same as the per person double occupancy rates. Share Passengers who smoke are not to do so in the cabin, unless okayed by fellow roommates. We try to match passengers with someone close in age, whenever possible. Note: Holland America will not accept any booking unless a fully completed Reservation Form is accompanied with a per-person deposit:

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EVERYONE**PANEL DISCUSSION:
THE FUTURE OF MAC SOFTWARE (1.5 hours)****Speakers:** Andy Gore, Jesse Feiler,
David Pogue, and Adam Engst

What's next for the Mac OS? What new applications will we see in the coming months — will there be new programs from new companies, or more of the same from the same players you've known for years? What features are in the future for the modern Mac? Come hear the experts discuss how Mac OS X will shape our world over the next few years.

**DAVID POGUE LIVE (below)
(1.25 hours)**

Live song spoofs at the piano, magic tricks, dumb-user stories, and evil Macintosh pranks. Don't drink and laugh at the same time. Enough said.

**GURU SESSIONS (45 minutes each)****Speakers:** Deke McClelland,
Adam Engst, Bob LeVitus

Here's your chance to ask an expert all those nagging technical questions you've had bottled up. In three separate one-speaker open "Guru" sessions, come and drill an expert and get those never-addressed questions of yours finally answered.

These sessions are open to all MacMania conference attendees as well as their spouses, guests, and children (John de Lanie's *The Devil and Billy Markham* is for adults only).

THE STORY OF THE APPLE II**Speaker:**
Steve Wozniak

Join Woz as he thinks the big thoughts, meditating on the nature of computing equipment that led to the early Apple computers. He will reflect on founding Apple, early company history and culture at a small and humble Apple, and how and why Apple's philosophy and vision changed the direction of "things."

**PUNDITS PANEL (1.5 hours)****Speakers:** Adam Engst, Andy Gore,
Bob Levitus, and David Pogue

A general industry talk.

THE CREATIVE MAC MANIAC (2 hours)**Speaker:** David Biedny

In a fun and informative session, David Biedny will delve into his bag of Macintosh tricks to amaze and astound the audience with tales of software rarely seen, wild images and weird sounds emanating from his trusty Powerbook. See how the Macintosh was used to make movie magic — you won't believe your eyes! See how images can be turned into music with a Mac-only program you've never heard of! See Photoshop techniques documented in no book, and hear tales of the history of Photoshop that no one else has ever told! And, best of all, take part in the wackiest Macintosh trivia contest ever devised, with some rare, collectable Macintosh prizes for the winners!

**A dramatic reading of the bawdy
THE DEVIL AND BILLY MARKHAM
(1 hour plus 30 minutes of questions)**

Speaker: John de Lanie (right)**SPEAKER PROFILES (CONTINUED)**

Jason Snell is the Editor of Macworld magazine. He has worked at Macworld for more than five years, including stints as the Editor of Macworld.com and the print magazine's features editor. Before joining Macworld in 1997, he was an editor at MacUser. In addition to his work covering the Mac, he teaches Web and information design at the University of California, Berkeley, and has been publishing on the Internet since 1991.

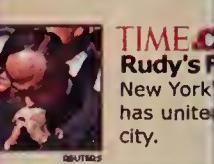
Sal Soghoian is widely touted as "the" AppleScript Guru and the driving force behind the continued expansion and acceptance of AppleScript. He began scripting in 1992, after discovering AppleScript could automate the publishing-related tasks at his service bureau. After spending years as an early "online evangelist," Sal continued to serve the AppleScript community as the AppleScript Product Manager at Apple. Throughout his tenure, AppleScript's importance, use, and integration has grown, becoming the indispensable tool for automation and communication on the Mac.

Daniel Steinberg is the Director of Java Offerings for Dim Sum Thinking in Cleveland, Ohio. He has covered Java on the Mac for the last five years for JavaWorld magazine, writes a monthly column for the O'Reilly Mac DevCenter, and is a regular contributor for IBM's developerWorks. He is the co-author of the *Java 2 Bible* (IDG Books), the *Java 2 Bible Enterprise Edition* (Hungry Minds), *Professional WebObjects* (Wrox), *Early Adopter Mac OS X Java* (Wrox), and upcoming titles on Extreme Programming in Java.

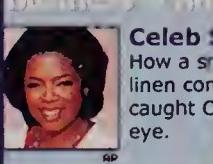
Daniel is a recovering Mathematician who runs seminars on the latest interest areas in Computer Science for area colleges trying to stay current. He is a non-apologetic Mac fan who curses whenever he has to spend too much time on his Windows box. His favorite moments are cooking for and with his wife and kids.



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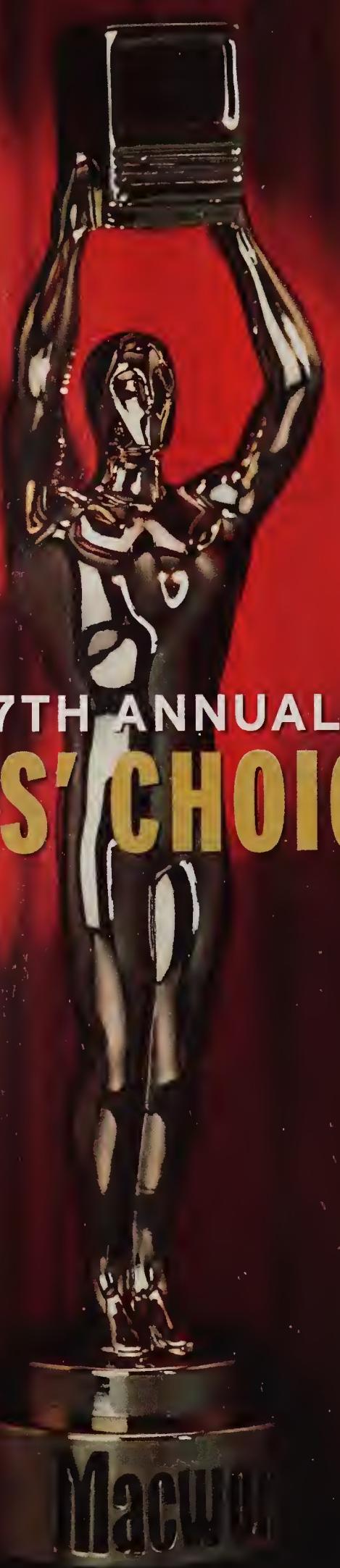
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THE 17TH ANNUAL
EDITORS' CHOICE AWARDS

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ELCOME TO OUR ANNUAL REVIEW of the products that help Mac users work and play—the Editors' Choice Awards. *Macworld's* editors surveyed every Mac product released between November 1, 2000, and November 1, 2001, to determine nominees and winners. We recognize these products not only for their overall quality but also for their creators' willingness to lead us in new directions.

In 2001, that new direction was toward Mac OS X. The Mac

community made heroic efforts to get through the tricky transition to the new Unix-based OS. And they did so as dot-coms crashed and fear about the economy and world politics put many companies into maintenance mode.

We will remember 2001 as the year that Mac OS X finally shipped and as the time when the people who make software began the hard work of rewriting applications. As the curtain opens, we applaud our nominees and toast the brighter year to come.

EDITORS' CHOICE AWARDS

CREATIVE/PUBLISHING

Illustration Software

WINNER When Pixologic's **ZBrush 1.2** (\$292; 888/748-5967, www.pixologic.com) debuted in November 2000, Mac artists suddenly saw 2-D drawing jump off the screen. Unlike traditional painting programs, which treat pixels as flat dots of color, ZBrush adds a depth attribute and lets you stack pixels in the third dimension, just as you'd pile a thick layer of oil paint onto a canvas. An assortment of brushes and controls lets you apply complex textures and realistic lighting effects to your creations.

RUNNERS-UP Toon Boom Technologies' **ToonBoom Studio** (\$374; 514/278-8666, www.toonboom.com) is a powerful Mac OS X tool for creating 2-D Web animations. Animators will love its unique lip-synching feature, which analyzes sound files and matches mouth movements to them. Adobe also entered the Mac OS X realm with the release of **Adobe Illustrator 10** (\$399; 800/833-6687, www.adobe.com). This version adds object-based slicing, as well as the ability to save graphics as symbols for later reuse.

Image-Editing Software

WINNER Photoshop is the king of professional image editing, but its price and complexity discourage many potential users. Adobe's previous efforts to bridge this gap have come up short, but its newest attempt, **Adobe Photoshop Elements** (\$99; 800/833-6687, www.adobe.com), is a clear success. The program conceals its formidable power behind an intuitive interface and low price. Channels, CMYK color, and advanced masking are missing, but few

besides graphics professionals will find Photoshop Elements lacking.

RUNNERS-UP It's easy to crank out pop-up JavaScript menus and simple Flash animations with **Macromedia Fireworks 4** (\$299; 800/457-1774, www.macromedia.com). This version also introduced customizable JPEG compression. With its Metamorphosis tool, **Test**

Strip 3.1, from Vivid Details (\$200; 800/948-4843, www.vividdetails.com), takes the fear out of achieving color fidelity. It walks you through a series of simple choices that let you change an image's dynamic range, brightness, color, and saturation.

Multimedia Product

WINNER Do you dream of having a portable sound-mixing studio? It's now possible, with a laptop and the world's first FireWire-connected audio-recording system, Mark of the Unicorn's **MOTU 828** (\$795; 617/576-2760, www.motu.com). It provides 18 simultaneous inputs and outputs in the form of eight analog channels, eight 24-bit ADAT lightpipe



channels, and stereo digital S/PDIF—as well as two microphone pre-amps with 48-volt phantom power—in a lightweight unit you can mount on a rack. MOTU 828 offers zero-latency monitoring and comes with AudioDesk, the Mac-only digital audio workstation (DAW) software.

RUNNERS-UP **Formac Studio**, from Formac (\$429; 877/436-7622, www.formac.com), lets you convert analog clips to digital video, capturing 30 frames per second at 48kHz and 16-bit audio. What sets it apart from other FireWire video-capture boxes is its built-in TV and radio tuner that lets you record straight to digital video. The virtual-rack interface you get in **Reason 1.0**, from Propellerhead Software (\$399; [46] 8 691 45 00, www.propellerheads.se), has knobs and sliders so realistic that people familiar with hardware-based systems will immediately feel at home. This MIDI-based analog synthesizer includes a drum machine, sampler, and loop player.

Web Development Software

WINNER Bare Bones Software has produced a star in **BBEdit 6.5** (\$119; 781/687-0700, www.barebones.com), the best multipurpose development application for OS X. The advanced text editor not only lets you run Perl, Python, and Unix shell scripts from within the application—a bonus for hard-core developers—but also has improved Cascading Style Sheets features, as well as new support for other Web development protocols, including PHP 4, WML versions 1.2 and 1.3, and Objective-C.

RUNNERS-UP Still setting the standard in the field of Web design tools, **Macromedia Dreamweaver 4** (\$390; 800/457-1774, www.macromedia.com) features a table-drawing tool, code-to-layout viewing options, and other welcome modifications. User-friendliness is the purpose of UsableNet's **Lift Onsite 2.0.1** (\$249; 212/965-5388, www.usablenet.com). The software lets users test Web sites for possible usability and accessibility errors. More important, users can tweak Lift Onsite to rank problems by seriousness or to look for specific performance issues.

Digital-Video Software

WINNER Apple's powerful **Final Cut Pro 2.0.2** (\$999; 800/692-7753, www.apple.com) bursts with professional-

level features. It supports everything from MiniDV to Beta SP and HD; it allows you to composite as many as 99 layers of video, audio, text, and graphics; and it offers sophisticated media-management tools and audio editing. And Final Cut Pro 2 is no slouch when it comes to performance: it takes advantage of dual-processor Macs and the G4's AltiVec subprocessor. With the addition of a Matrox RTMac, its new QuickTime architecture even supports real-time effect and transition previews.

RUNNERS-UP Apple's **DVD Studio Pro 1.1** (\$999; 800/692-7753, www.apple.com) is the first software-only tool for creating professional DVDs on your Mac. It supports as many as 99 video tracks (with eight audio streams per track), encodes MPEG-2 video and Dolby Digital audio, and works with external FireWire DVD-R burners. **Adobe Premiere 6.0** (\$549; 800/833-6687, www.adobe.com) offers many professional features at a hobbyist price. This version supports all digital-video types and nonsquare pixels. It also has one-step Web output, new logging features, and a powerful audio mixer.

3-D-Graphics Software

WINNER If you make your living working with 3-D, then you need NewTek's mature **LightWave 3D 7b** (\$2,495; 800/862-7837, www.newtek.com). This version includes a new motion mixer, improved particle FX and dynamics systems, better rendering tools, numerous interface enhancements, and more-powerful modeling. Best of all, LightWave takes full advantage of the Mac platform, offering support for

Mac OS X, OpenGL, AltiVec, and multiple processors.

RUNNERS-UP Alias|Wavefront's powerful **Maya for Mac OS X 3.5** (\$7,500; 800/447-2542, www.aliaswavefront.com) has finally come to the Mac, providing spline 3-D modeling, general and character animation, particle and dynamics tools, and professional-quality rendering. Maxon's **Cinema 4D XL 7.1** (\$1,695; 877/226-4628, www.maxon.net) improves on an already strong product with multipass and 16-bit rendering, radiosity, adaptive antialiasing, polygon reduction, new lighting modes, Shockwave 3D export, and support for Mac OS X.

Digital Camera

WINNER It's easy to say that more is better, but when it comes to digital imaging, a two-megapixel digital camera fits most people's needs *and* budgets. Canon shines in this category with its **PowerShot S110 Digital Elph** (\$499; 800/652-2666, www.powershot.com), a masterpiece of compact design with an intuitive interface and excellent picture quality. If you're ready to replace your basic film camera, the Digital Elph is the one to buy.

RUNNERS-UP Nikon's 3.1-megapixel **Coolpix 995** (\$899; 800/645-6687, www.nikonusa.com) is the latest in Nikon's successful Coolpix 900 line. With its powerful pop-up flash and 4x zoom lens, you'll be able to make beautiful pictures. Canon's four-megapixel **PowerShot G2** (\$999; 800/652-2666, www.powershot.com) has more pixels than any other camera priced under \$1,000.

continues

PRODUCTS OF THE YEAR

HARDWARE

NEARLY TEN YEARS AFTER it defined portable computing, Apple once again established itself as an innovator by releasing not one but two sterling notebook lines in 2001. The new iBook captured our imagination with its compact size, complete feature set, and low price; however, in our estimation, the **Titanium PowerBook G4** is the best product Apple has produced since the original iMac. The 667MHz model (\$2,999; 800/692-7753, www.apple.com), released in October, is a good machine made even better, with a faster, 133MHz system bus; an ATI Mobility Radeon graphics chip; and a whopping 30GB hard drive.

SOFTWARE

WE WON'T REMEMBER 2001 as a landmark year for software. Software companies, wary of releasing new applications before Apple unveiled Mac OS X, held off on groundbreaking new updates. A notable exception is **Microsoft Office v. X** (\$499; 800/426-9400, www.microsoft.com/mac). Built to run solely on Mac OS X 10.1, it gives Mac users a persuasive reason to leave OS 9 behind. Most of Office's new features are helpful but unspectacular—it's the suite's adaptation of the Aqua interface that makes this version shine. Office v. X is a glimpse of what lies ahead as more applications are rewritten to run on the new Mac OS.



EDITORS' CHOICE AWARDS GENERAL MAC

Education Software

WINNER Pitsco Lego Dacta's amazing **RoboLab 2.5** (\$230; 800/362-4308, www.pldschool.com) brings computer-controlled robots built from Lego bricks to the Mac. Now, with the latest update to the companion software, newer Macs can join in the fun—RoboLab 2.5 supports USB (as well as many programming features not available on Windows).

NOW THAT
APPLE HAS
LAID THE
FOUNDATION,
WE HOPE TO
FEEL THE
IMPACT OF
MAC OS X'S
STABILITY
AND POWER.

wowed the crowd at its Macworld Conference & Expo debut in July 2001—and with very good reason. The encyclopedia CD-ROM incorporates Mac OS X's Aqua interface, and it takes advantage of the new operating system's multimedia capabilities.

Game

WINNER Sports games are few and far between on the Mac, so **Tony Hawk's Pro Skater 2**, from Aspyr Media (\$45; 888/212-7797, www.aspyr.com), stands out from the crowd. But other factors—fast-moving action, sharp-looking 3-D graphics, and Mac OS X compatibility right out of the box—vault it into the rarefied air of top Mac games.



Throw in multiplayer gaming, a skate-park editor, and other customizable features, and you've got a game that keeps on rolling even when others fall by the wayside.

RUNNERS-UP No children's art software comes close to matching Broderbund's **Kid Pix Deluxe 3.0** (\$25; 800/395-0277, www.kidpix.com). With the latest version, the company builds on the program's success by adding new drawing tools, appealing sound capabilities, and thousands of movable and animated stickers. **World Book 2002 Mac OS X**, from World Book (\$65; 800/967-5325, www.worldbook.com),

IMPACT AWARD

EXTENSION CONFLICTS, inefficient memory management, and limited multiprocessor support—all these problems bogged down Mac OS as the 20th century came to a close. To ensure the operating system's future, Apple's engineers needed to completely rewrite it. So they did just that, and in 2001, the Mac world met Mac OS X.

But as we learned this year, shipping an OS is only the start. The first version arrived in March, but the new OS wasn't ready for most Mac users until September's release of **Mac OS X 10.1** (\$129; 800/692-7753, www.apple.com). At the same time, Mac users waited for key applications. Some companies—such as FileMaker, Macromedia, and Bare Bones—shipped OS X versions of their software early on, but it wasn't until Microsoft released Office v. X late in the year that we could finally begin to imagine a classic-free world.

Mac OS X's release made last year one of transition. Now that the groundwork is laid, we hope to feel the true impact of the modern operating system's stability and power.

add convenience and make VectorWorks the right choice for a broad range of drafting jobs.

RUNNERS-UP Wolfram Research's **CalculationCenter** (\$295; 800/965-3726, www.wri.com) taps the power of its Mathematica application—long the standard for performing numeric and symbolic calculations—and gives it a more accessible interface. CalculationCenter is Mathematica for the rest of us. CrystalMaker Software spent two years rewriting its molecular-modeling program, **CrystalMaker 5.0** (\$499; [44] 1869-369393, www.crystalmaker.com). The result is a program that has multiple windows and views, the ability to create more atoms and bonds, and better performance in OS X's Classic mode.

Development Software

WINNER Real Software's **Realbasic 3.5.1** (\$150; 512/263-1233, www.realbasic.com) is not only the easiest way to start programming a Mac application but also the smartest way to conquer cross-platform development. Programmers can create their applications once and then use the same code and layout to compile them for OS 9, OS X, and Windows XP. This version adds Microsoft Office v. X tools for automatically creating and modifying documents and components.

RUNNERS-UP Apple's **Interface Builder** (free with \$129 OS X; 800/692-7753, www.apple.com) has an easy-to-use graphical interface that can help you create Aqua interfaces for both Carbon and Cocoa applications. Late Night Software's **Script Debugger 3.0** (\$189; 250/380-1725, www.latenightsw.com) makes AppleScript users more productive with its new features and additional Mac OS X support. With the addition of BBEdit integration, it can also debug JavaScripts and import scripts as HTML files.

Acceleration Product

WINNER Nvidia's **GeForce3** (\$499; 408/486-2000, www.nvidia.com) is one of today's most advanced graphics processors—and it came to the Mac *first*. With 57 million

transistors in its graphics-processing unit, it's more complex than the G4 processors that drive today's Macs. It even includes a feature called the nfiniteFX engine that allows game developers to add custom real-time effects to their titles. Hard-core gamers and 3-D professionals shouldn't pass this one up.

RUNNERS-UP The old saying that two heads are better than one is also true of dual processors. Sonnet Technologies' **Encore/ST G4 Duet** (\$700; 949/587-3500, www.sonnettech.com) processor upgrade puts two processors into AGP Macs. Acard's **AEC-6880M/ATA-133 RAID** (\$179; [886 (2)] 8512 2290, www.acard.com) will make your Mac fast. It's the first RAID card to support the new 133MB-per-second ATA. It's also easy to use—you don't need any extra software to run a RAID 0 array.

Display

WINNER With their small footprints and slim profiles, flat-panel displays have long tempted Mac users, and this year prices also fell across the board. Finally, a midsize LCD is an attractive alternative to a standard CRT monitor. The 17.4-inch **Formac gallery 1740** (\$899; 877/436-7622, www.formac.com) is the first non-Apple monitor to incorporate the one-cable Apple Display Connector (ADC) technology. It offers a native resolution of 1,280 by 1,024 pixels, a bright picture, sharp image detail, and a large viewing area, at a great price.

RUNNERS-UP The **electron22blue III** (\$999; 503/844-4500, www.lacie.com) CRT monitor, from LaCie, is an excellent value for the color professional. The flat-aperture-grille monitor features a 20-inch viewing area, a standard hood, and a maximum resolution of 2,048 by 1,536 pixels. A handy gadget from ViewSonic, the **VB50HRTV** (\$130; 800/888-8583, www.viewsonic.com) can turn a VGA monitor into a TV. Use the included remote to switch from computer display to VCR, DVD, cable, or broadcast television.

continues



OFFICE PRODUCTS

Business-Productivity Software

WINNER Many Mac users didn't feel they had good reason to upgrade to OS X until **Microsoft Office v. X** (\$499; 800/426-9400, www.microsoft.com/mac) arrived. Besides its excellent integration into OS X, the popular and ubiquitous Office suite includes a significant upgrade to the year-old Entourage personal information management (PIM) application, as well as other improvements, such as noncontiguous text selection in Word.

RUNNERS-UP For businesses that operate in a cross-platform world, the operating-system emulator **Connectix Virtual PC 4** (\$199 for Windows 98 or ME, \$249 for Windows 2000; 800/950-5880, www.connectix.com) is an indispensable tool. This version features dramatically improved performance. You also can run multiple operating systems simultaneously, including Windows 95, 98, ME, NT, and 2000, and Red Hat Linux. The innovative **mimio 1.5**, from Virtual Ink (\$599; 877/696-4646, www.mimio.com), blew us away last year by hooking up our Macs to conference-room whiteboards. The supporting software now adds QuickTime and iMovie export, bringing life to all that impassioned brainstorming in boardrooms and classrooms.

Data-Management Software

WINNER If you rely on the Mac to manage your business, you've had slim software pickings ever since Intuit stopped developing QuickBooks for the Mac. **MYOB AccountEdge 2.0** (\$249; 800/851-1315, www.myob.com) is more than just a credible replacement—it's a big step up in accounting software, and it embraces Mac OS X. This version has a

streamlined interface, an enhanced contact-management feature, a faster setup process, and online-banking capabilities.

RUNNERS-UP FileMaker was one of the first big companies to release a Mac OS X-native version of a major Mac application, but don't dismiss **FileMaker Pro 5.5** (\$249; 800/325-2747, www.filemaker.com) as just an Aquafied rehash. FileMaker moved to

OS X without missing a step, adding record-level security and taking advantage of the operating system's multitasking features and graphics engine. Likewise, it would be easy for Intuit's **Quicken 2002 Deluxe** (\$60; 800/952-2558, www.quicken.com) to get by on reputation alone. But Intuit narrows the gap between the Mac and the Windows versions by adding one-step updating and an automatic checkbook-reconciliation feature to the latest Mac OS X-native iteration.

IF YOU RELY
ON THE MAC
TO MANAGE
YOUR BUSI-
NESS, MYOB
ACCOUNTEDGE
2.0 ENDS AN
ERA OF SLIM
PICKINGS.

Personal Digital Assistant

WINNER The year's best PDA was the **Palm m505** (\$449; 800/881-7256, www.palm.com), hands down. With a USB connection, a high-resolution color screen, and a new version of Palm OS, this PDA is out to win the hearts of mobile Mac users, wherever they may be. And what's more, the SD expansion slot and universal connector will allow Palm-heads to add a slew of hardware products to their handhelds.

RUNNERS-UP Who says that Visors have gone out of style? Handspring's **Visor Edge** (\$299; 888/565-9393, www.handspring.com) was by far the sleekest PDA to hit the street in 2001. Its metal casing and low-profile design make it the perfect companion to a Titanium PowerBook G4. For Mac users who want the basics at an affordable price, the **Palm m125** (\$249; 800/881-7256, www.palm.com) can't be beat. It features the same expansion capabilities as the m505, but it has the same design as the entry-level Palm m100.

Productivity Utility

WINNER QuicKeys has helped Mac users work quickly and easily for more than a decade. And last year CE Software released **QuicKeys X** (\$60; 800/523-7638, www.cesoft.com), a Cocoa-based application that lets users automate repetitive tasks in Mac OS X. The utility is now easier to learn and less expensive, and it adds a nifty new script editor.

RUNNERS-UP The extremely useful **FileGuard 4.0**, from Intego (\$60; 305/868-7920, www.intego.com), lets you password-protect and encrypt anything from local files to folders to entire hard drives. Aladdin Systems' **StuffIt Deluxe 6.5 for Mac OS X** (\$80; 800/732-8881, www.aladdinsys.com) includes the well-loved Magic Menu in the Finder menu bar and installs Palm OS files for you. Some Mac users just wouldn't convert to OS X unless they had a way to compress and attach a file to an e-mail message with one drag and drop.

System Utility

WINNER A standout this year was Brian Hill's shareware utility **BrickHouse 1.1b6** (\$25; <http://personalpages.tds.net/>



[~brian_hill/brickhouse.html](#)). It allows you to access the BSD firewall built into Mac OS X through an easy-to-use graphical interface. You can set and activate your firewall's filters without digging into the command line. It runs on all versions of Mac OS X and has numerous advanced filtering options, all of which are accessible via the GUI.

RUNNERS-UP Sometimes, the best things in life are free: an example is **Unsupported UtilityX 2.0**, a utility built by Ryan Rempel (free; <http://eshop.macsales.com/OSXCenter/framework.cfm?page=UnsupportedUtilityX.html>). It helps you install and boot Mac OS X, Mac OS X Server, and Darwin on unsupported systems. **Drive 10**, from Micromat (\$70; 800/829-6227, www.micromat.com), is an OS X disk utility for repairing drives, recovering data, and performing automatic backups of volume structure data. You get all this and a pretty Aqua interface too.

Printer

WINNER Epson's **Stylus C80** (\$149; 800/873-7766, www.epson.com) is a radical departure for the company that brought the terms *photo-quality* and *ink-jet* together. With long-lasting, durable pigment inks; individual ink tanks; and the best speed of any printer in its class, the Stylus C80 puts to rest the idea that Epson printers are best suited to graphics and don't do well on plain paper. In fact, it's the best all-around ink-jet printer we've seen in years.

RUNNERS-UP We saw explosive growth in photo printers this year, and Epson's **Stylus Photo 820** (\$149; 800/873-7766, www.epson.com) is our favorite. It combines excellent quality and borderless printing with a low price. The **Brother HL-1670N** (\$749; 800/276-7746, www.brother.com) is a speedy black-and-white laser printer that works as well at home as in the office. Its resolution-enhancing technology produces the beautiful text of a higher-dpi printer.

Storage Product

WINNER While everyone was looking for killer apps, Pioneer developed the killer drive. The **DVR-A03** (\$649;

800/421-1404, www.pioneer-electronics.com) is the first drive to cost less than \$1,000 *and* write to DVD-R media, giving everyone a tool for creating discs that will play in standard set-top DVD players. The drive also writes CD-R, CD-RW, and DVD-RW media, making it an excellent archiving and backup drive.

RUNNERS-UP M-Systems' **DiskOnKey** (\$30 for 8MB; 866/347-5665, www.diskonkey.com) is the size of a Bic lighter and connects to any Mac or PC via USB. Unlike other Flash memory drives, DiskOnKey mounts as soon as you plug it in—you don't need to install a driver. The Ecrix (now Exabyte) **VXA-1 FireWire** (\$999; 303/402-9262, www.ecrix.com) is the most reliable desktop tape drive ever. When the FireWire version of the drive shipped this year, we found the perfect drive for backing up 33GB of data.

Input Device

WINNER We've seen other LCD tablets, but Wacom's **Cintiq** (\$1,899; 800/922-9348, www.wacom.com) is special. Wacom not only updated its pen to support 512 different levels of pressure sensitivity but also set the price at half that of its former LCD tablets. (Last year's runner-up for best display, the Wacom PL 500, cost \$3,999.) The Cintiq's clear picture and slim design are every bit as beautiful as the digital images it helps you create. The flat-panel LCD tablet features 16.7 million colors, a resolution of 1,024 by 768 pixels, and a full 15-inch diagonal viewing area. It can lie flat or pivot to angles between 18 and 72 degrees.

RUNNERS-UP Two major trends emerged in input devices last year: wireless and optical. Logitech's **Cordless MouseMan Optical** (\$70; 800/231-7717, www.logitech.com) was the first to combine the two, and it did so in a smart design with advanced battery-saving features. Another contender, Kensington Technology's **Turbo Mouse Pro Wireless** (\$130; 800/235-6708, www.kensington.com) gave users a wireless device with 11 different buttons and the industry's best software for programming them. **m**

Lab Director KRISTINA DE NIKE managed this year's awards.

TECHNOLOGY OF THE YEAR



IN 2000, iMOVIE brought digital-video editing to all Mac users. Last year, we realized we needed a way to distribute and share our masterpieces. **SuperDrive**, the amazing DVD and CD burner also known as Pioneer's DVR-A03, came to the rescue. Apple then brought us **iDVD**, an easy-to-use, though limited, DVD-authoring application—the first of its kind on any platform—and followed that up with **DVD Studio Pro**, a more complete package for professionals. We give the Technology of the Year award to Pioneer and Apple, for making the Macintosh the best platform for creating DVD-R discs.



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Seybold Seminars focuses on the challenges of print, Web, video and other forms of media technology. Its educational programs highlight the latest in graphic design production tools, design and information architecture strategies, digital rights and asset management, marketing personalization and on-demand publishing opportunities. Conferences address the technical challenges of applying cross-media publishing to create new business models, controlling intellectual property rights and ensuring brand consistency. This year's two new conferences, the Seybold Enterprise Publishing Conference and the Seybold PDF Conference, highlight the importance of publishing in corporate America.



The Seybold Enterprise Publishing Conference

The Seybold Enterprise Publishing Conference is relevant for everyone involved in cross-media publishing, specifically content creators, strategic IT professionals and business managers who drive communications. This conference covers issues important to commercial and corporate publishers that use the latest technologies to create print, cross-media and Web workflows. Learn best practices and how you can immediately implement existing solutions in your business. The Seybold Enterprise Publishing Conference includes:

The Seybold Summit, a one-day program on publishing strategies. The Summit focuses on cross-media authoring tools, digital rights management systems, one-to-one marketing techniques and relevant business issues.

A full day on **technology issues** that examines technology advancements and best return on investment. Choose from three tracks: cross-media publishing, print publishing, and Web publishing technology and design.

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- PDF for Enterprises and Government
- PDF for E-Publishing
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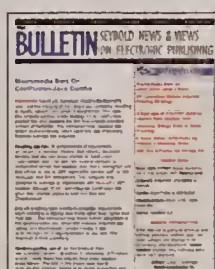
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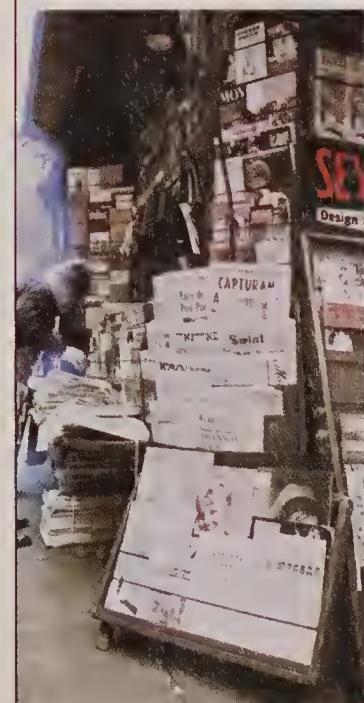
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KEYNOTES

Wednesday, February 20

Special Keynote

Arthur O. Sulzberger, Jr., Chairman, The New York Times Company, Publisher, the *New York Times*

Thursday, February 21

Joe Eschbach, Vice President, ePaper Solutions Group, Adobe Systems, Inc.

Paul Showalter, Senior Technical Printing Specialist, Internal Revenue Service

Check online for a complete schedule of keynotes.

EXPO HOURS

| | |
|------------------------|----------------|
| Wednesday, February 20 | 10:00am–5:00pm |
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| Friday, February 22 | 10:00am–3:00pm |

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Hands-on Tips and Expert Advice for Savvy Mac Users

Customize OS X's Finder Toolbar

BY JOSEPH SCHORR

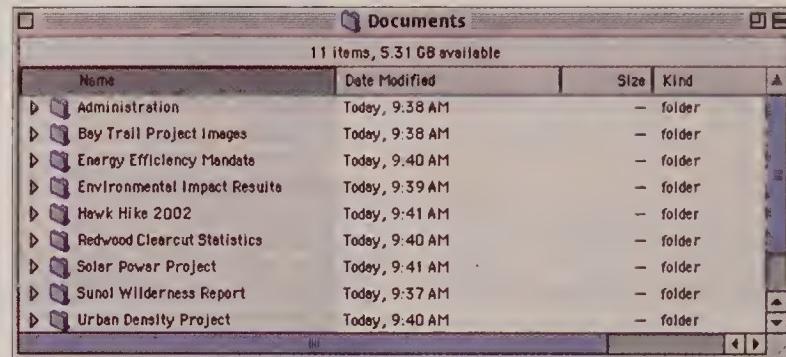
One of the most radical new features of Mac OS X's reworked window scheme is the Finder toolbar. Visible at the top of every Finder window, the toolbar is a thick strip of Web browser-like buttons; it was designed to help you navigate more easily through the potentially confusing world of Mac OS X. And to a certain degree, it succeeds. For example, clicking on the toolbar's Home button takes you to the directory that contains the obscurely placed Documents folder.

But not everyone has greeted the toolbar with great enthusiasm. Its big, chunky buttons are reminiscent of the old Launcher, and those of us with smaller monitors don't appreciate its screen-hogging presence at the top of every window (although you *can* hide it at any time, by pressing $\text{⌘}-\text{B}$). The cloying, heart-shaped Favorites button alone (which Apple saw fit to place smack in the middle) might drive some users to permanently turn off the toolbar.

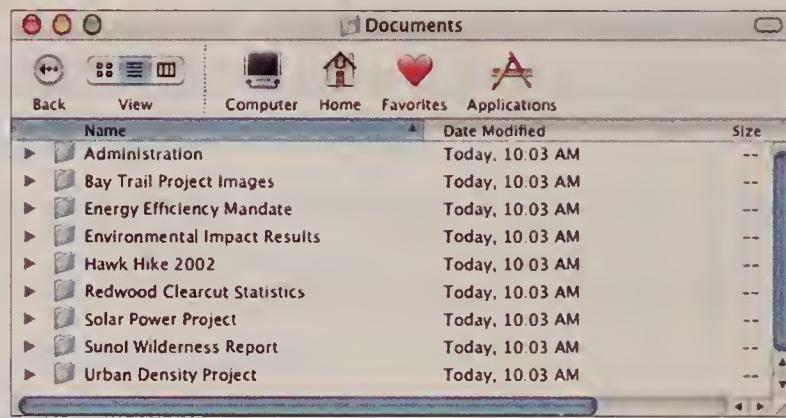
But you might not want to do that—at least not until you've finished reading this article. You have tremendous control over what the toolbar offers. Spend a few minutes customizing it, and the toolbar could end up as one of your favorite Mac OS X features. Properly tweaked, it provides more than just shortcuts to Mac OS X's main folders; the toolbar can launch programs, create new folders, delete documents, and do plenty of other file-management tasks.

This step-by-step guide will help you build the ultimate Finder toolbar—one that you'll really use. **m**

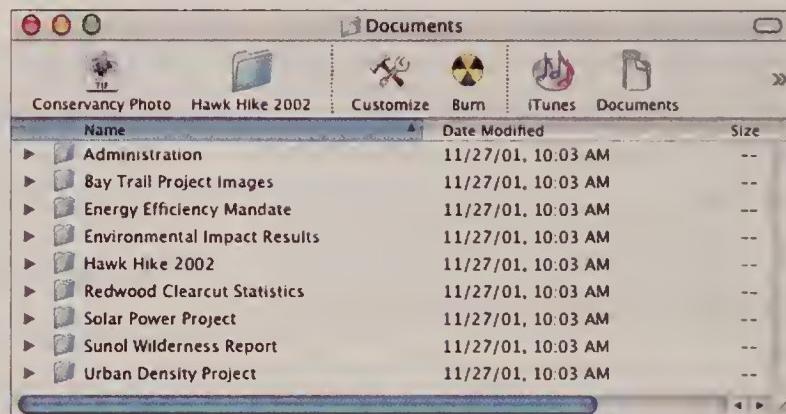
JOSEPH SCHORR is a coauthor of *Macworld Mac Secrets*, sixth edition (Hungry Minds, 2001).



In Mac OS 9, Finder windows don't have navigational elements.



Mac OS X Finder windows include the toolbar and a default set of icons that you can click on to get to different parts of your hard drive. These navigational elements are useful but limited.



You can tweak the Finder toolbar in many ways, tailoring it to fit your working style like a glove.

More Info: www.macworld.com/subject/macosx/archive.html

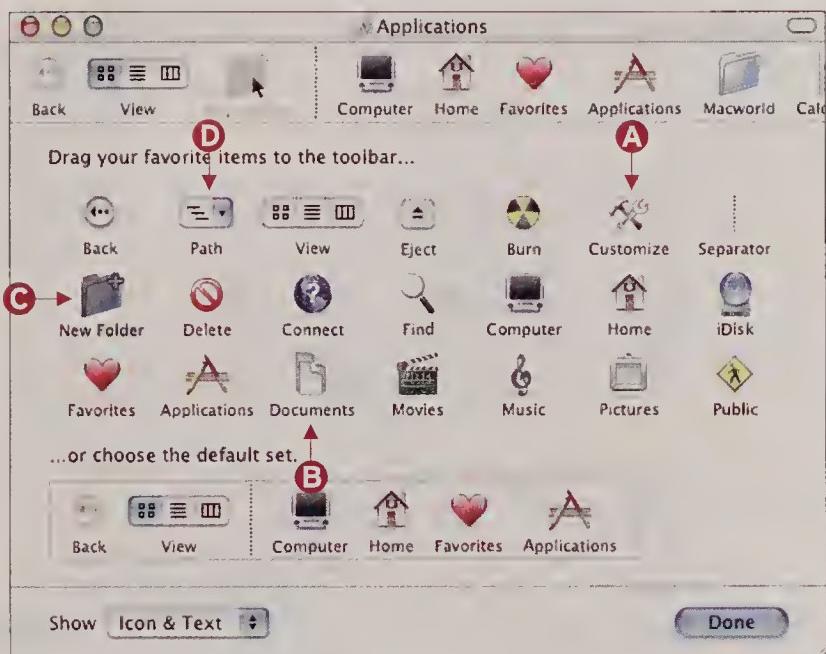
Want to see what *Macworld* has to say about Mac OS X? Check out this list of all our OS X news, reviews, and how-tos.

1

Change the Default Buttons Fresh out of the box, the Finder toolbar contains a paltry six buttons with barely enough value to justify the screen real estate they occupy. Your first job, therefore, is to scrap this default configuration and rebuild the toolbar, using the Customize Toolbar command.

If you've hidden the toolbar, choose Show Toolbar from the Finder's View menu, or press ⌘-B . Open any Finder window. Then choose Customize Toolbar from the Finder's View menu.

The Customize Toolbar panel then fills the window, showing you 15 additional icons you can add to the toolbar.



To put a new item on the toolbar, just drag it into position. Some of the available buttons are real gems. Add the following items to create a powerful toolbar:

A Customize: This one activates the Customize Toolbar command itself (for which there is no keyboard shortcut). It saves you repeated trips to the View menu and makes adding new buttons easy.

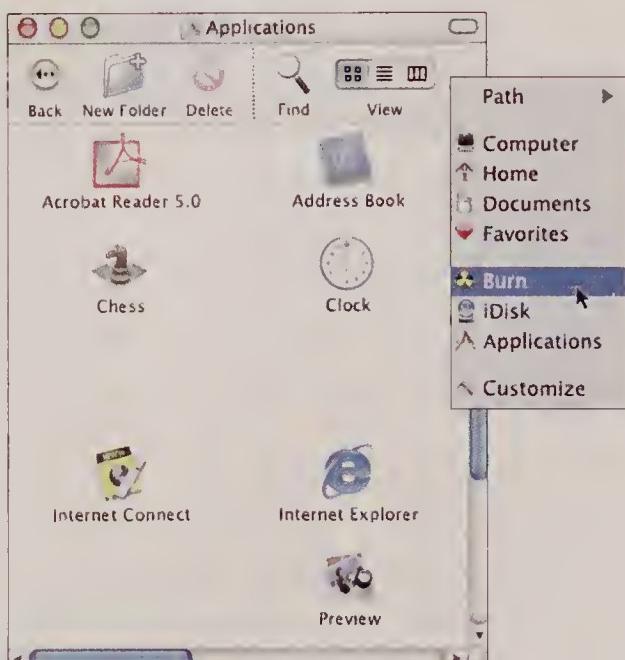
B Documents: Under Mac OS X, each logged-in user has his or her own private Documents folder—but it's buried three levels deep on the hard drive. Although the default Home button takes you to the directory that contains the Documents folder, the Documents button opens the folder itself, giving you quick access to your documents.

C New Folder: With OS X, the keyboard shortcut for creating a new folder has changed from ⌘-N to ⌘-shift-N . If you always forget that extra key and don't want to choose the New Folder command from the File menu, add the New Folder button to your toolbar.

D Path: It's not a button; it's a pop-up menu that reveals the file path to the folder you're currently viewing. However, if space is at a premium on your toolbar, don't add the Path button; you can get the same path information simply by opening a folder and ⌘-clicking on its name in the title bar (just as in earlier versions of Mac OS).

Other items to consider adding are Delete (performs the equivalent of dragging a selected item to the Trash), Find (launches Sherlock), and Burn (if you've got a CD-RW-equipped Mac).

Don't worry about adding too many items. If your icons overflow the toolbar, it automatically sprouts a fly-out menu on its right side, so all buttons are listed.



continues

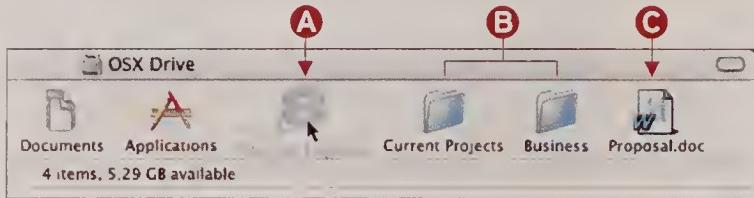
2

Drop In Your Own Icons Reconfiguring with the Customize Toolbar command is just the beginning. The toolbar's real power is in its ability to contain more than just Apple's 20 predefined icons—you can add almost *any* item, including folders, documents, programs, aliases, and more.

3

Style the Toolbar Once you've come up with the perfect suite of items to include in your toolbar, you can fiddle with the buttons, juggling their order, grouping them with separators, and displaying them either as icons or as text-only buttons.

To add your own items to the Finder toolbar, you don't have to use the Customize Toolbar command; you can drag the icons you want directly to the toolbar at any time (just as you can with the Dock).



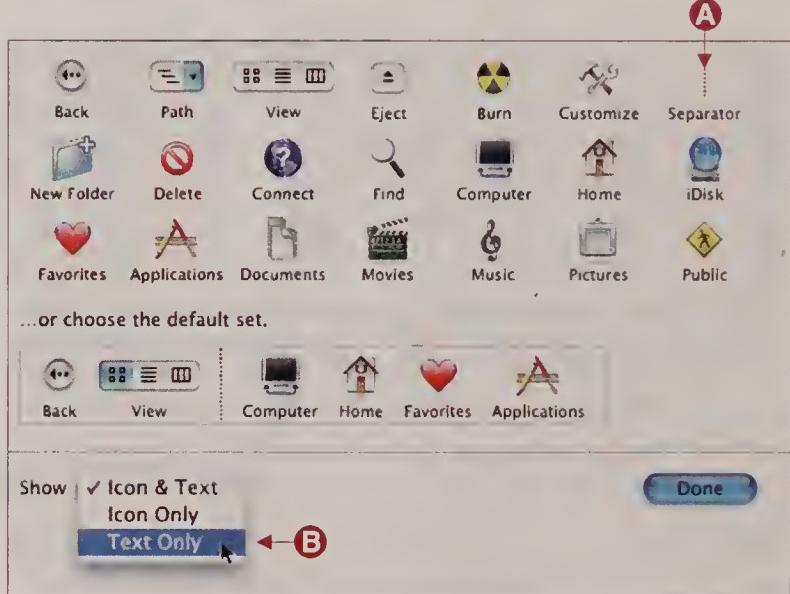
When you drag an icon into position, hold down the mouse button and wait a moment as the other toolbar icons slide politely out of the way to make room for your new button, then drop it into position **A**.

You can add all of your favorite programs this way, but don't limit yourself to applications. Add any of your frequently visited folders **B**; accessing them this way is generally faster than using Favorites or double-clicking on an alias on the desktop, because the toolbar is always as close as the nearest open Finder window.

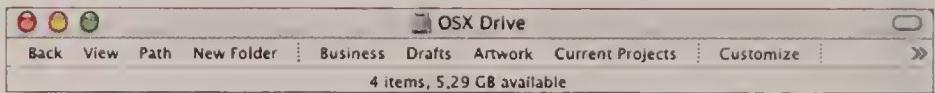
Add the documents you're currently working on, too **C**. Remember, you can add these items at any time by dragging them to the toolbar, and you can remove them almost as easily—just ⌘-drag them from the toolbar to your desktop.

After selecting the icons you want in your toolbar, it's easy to rearrange them to fit your needs. You can change the order of toolbar icons by holding down the ⌘ key and dragging the icons into place.

To organize icons into logical groups, you can drop in Separator lines. Return to the Customize Toolbar panel (View: Customize Toolbar, or click on your newly installed Customize button) and drag as many Separator lines as you need into position on the toolbar **A**.



Use the Show pop-up menu at the bottom of the Customize Toolbar panel to select button-display options—they can appear as icons (with or without text) or as text only **B**. Folder icons are indistinguishable from one another, so you may want to avoid the Icon Only option if you've added more than one folder to your toolbar. Use the Text Only option if you want your toolbar to take up a minimal amount of window space.



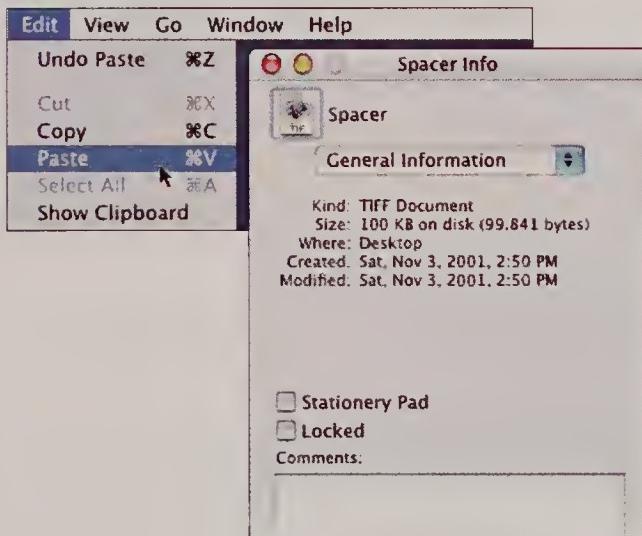
4

Create Spacer Icons Adding blank space between groups of buttons on the toolbar can help keep it organized. The Customize Toolbar panel doesn't include any ready-made spacers, but you can add them yourself by making an existing icon invisible and dragging it to the toolbar.

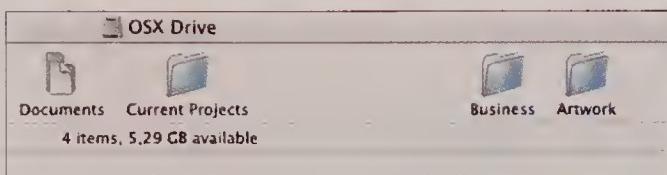
Adding a blank space is easy if you're using the Text Only view on your toolbar. Just create a dummy file—a text clipping or an empty folder—and rename it with blank spaces. Then drag it to the toolbar to add a space between existing buttons.

In Icon Only view, it's a little trickier: using a program such as Adobe Photoshop or Apple-Works, create a blank white picture that is one pixel by one pixel in size; then copy that one-pixel image to the Clipboard. (You can also use Mac OS X's Grab utility to capture a single-pixel image from any open window and then copy that.)

Select a dummy file, choose Show Info from the File menu, and Paste, replacing the file's icon with the one-pixel white dot.



Close the Show Info window, and you have an icon that's invisible. Replace the name of the file with spaces, and even the name disappears. Now you're ready to drag it to the toolbar, where it will function as an invisible spacer between your other buttons.

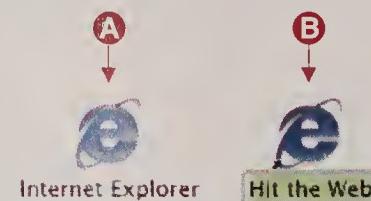


5

Rename Icons Adding your own folders and documents to the toolbar can be convenient but may not seem practical for items with long file names. You can't directly rename the icons in the toolbar, but this simple renaming trick solves the problem.

Before adding an item to the toolbar, make an alias of it (File: Make Alias, ⌘-L, or ⌘-option drag the file).

Now rename the alias, leaving the original file untouched, and drag it to the toolbar. In the following example, "Internet Explorer" is the name of the original button **A**, but I've renamed its alias ("Hit the Web") **B**.



Even if long file names aren't a problem, this approach gives you much more flexibility when you set up your toolbar.



Using these techniques, one quick customization session yields a Finder toolbar that looks and works just the way you want it to. After a few weeks of clicking through Mac OS X using your personalized toolbar, you may wonder how you ever got along without it.



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Print Publishing Secrets

You already know that design elements such as layout and color can influence viewers. But did you know that typographic color—the gray value, or density, of type on a page—also affects a reader's experience? Typically, that experience will be better if the typographic color is consistent. In QuarkXPress 4.1, you can manage your publication's typographic color in many ways, from strong-arm to subtle.

Mind Your H&J P's and Q's

The typographic color of a document is determined by the spaces between characters and words. In XPress, you can exert sweeping, document-wide control over these spaces through the Hyphenation and Justification (H&J) settings. For consistent type color, you should refine your H&J settings before you type a single word.

To edit your document's H&J settings, open the Edit menu and select H&Js (or press ⌘-option-H). Choose the Standard option and click on Edit. The Hyphenation settings (which control how and when XPress hyphenates words) typically require only minor tweaking. XPress's default Auto Hyphenation settings (Smallest Word: 6, Minimum Before: 3, and Minimum After: 2) are usually acceptable. But you'll probably want to restrict the number of hyphens allowed at the end of consecutive lines by changing the Hyphens In A Row setting from Unlimited to 2 or 3.

Your ideal Justification settings, however, will vary depending on your typeface and column widths. If you find that XPress's default Space settings (which control the amount of space between words in a justified column of text) leave you with gaping holes in your text, try setting the Opt. value to 100 percent and the Max. value to 150 percent. If your typeface's overall spacing seems too loose, you may also want to experiment with the Char settings, which control the amount of space between individual characters. Some designers prefer setting the Min. value to -3 percent, the Opt. value to 2 percent, and the Max. value to 3 percent.



Local Color

Although changing your H&J settings is a good first step in evening out your typographic color, sometimes you need localized refinements to correct problems such as rivers and unsightly line endings. This is where tracking comes in handy.

Tracking with Style Tracking adjusts the spacing between three or more selected characters, including the spaces between words. XPress offers several ways to track—the quickest way is to highlight words and enter a new

tracking value in the Measurements palette. However, you will get the most-consistent typographic color by using character styles, based on your other character styles, for tracking. For example, in addition to having a "Body Text" style, you might also want a "Body Text -1" that adds a tracking value of -1 to that style.

To create a character style that tracks text, open the Edit menu and choose Style Sheets (shift-F11). Now select the character style you want to track and click on Duplicate. In the Character Edit Style Sheet dialog box, enter a new name for your style. Change the tracking value and click on OK. To finish, save the style sheet. Now when text isn't fitting properly, you can simply highlight the offending words or lines and apply the custom character style.

This method is more consistent and easier to undo than XPress's other ways of tracking. You can easily search for and replace these character-level style sheets—to do so, just choose Find/Change from the Edit menu (⌘-F) and deselect the Ignore Attributes box.

Selective Tracking Keep in mind that XPress's tracking (even with character style sheets) applies to spaces between both characters and words. To be able to apply tracking only to the spaces between words, you can download the free Type Tricks 1.4 XTension (www.quark.com). With Type Tricks, you can reduce or expand spaces between selected words—without affecting the spaces between those words' characters—by pressing the keyboard combination ⌘-control-shift and tapping the left or right bracket key. To move in smaller increments, hold the option key down, too.

To Everything, Kern, Kern, Kern

Even subtle modifications can make a very big impact on your type's density. Font designers generally optimize the spaces between adjoining characters so that words are easier to read. However, some typefaces lack this optimization for some character pairs—for example, the commonly troublesome pair WO—or for all characters. That's when you can take charge.

Manual Kerning When two letters seem too close or too far apart, you can kern manually to space them more evenly. Place your cursor between the offending letters and enter your preferred value in the Measurements palette.

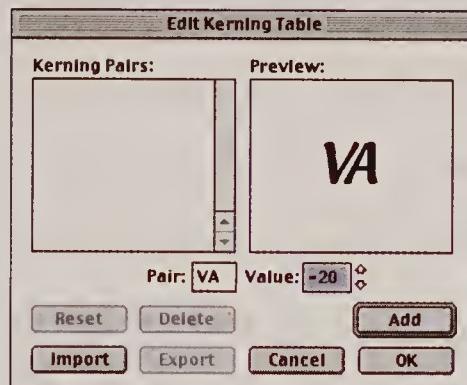
Unfortunately, if you manually kern more than a few pairs here and there, removing these adjustments later can be a time-consuming process—unless you turn again to the Type Tricks 1.4 XTension. Type Tricks lets you restore your text's defaults simply by selecting text, opening the Utilities menu, and choosing Remove Manual Kerning.

Automatic Kerning If you find yourself repeatedly kerning the same letter pairs, you can save yourself time—and tedium—by automating the process with the Kern/Track Editor XTension, which comes free on the XPress disc. Say the Valley View realty company hires you as an in-house designer and asks you to give all of their collateral material a makeover. You choose a typeface that perfectly expresses the company's corporate philosophy, and you plan to use it as logotype in all of Valley View's letterhead, brochures, and so on. Unfortunately, you discover that the font produces an unsightly space between the capital letters V and A (see "Wide Open Spaces")—a combination that will appear frequently in the company's materials. So you decide to close that nasty gap forever.

First, set the word VALLEY in the desired font at a large type size, so you can clearly see the gap between the letters. Next, choose Kerning Table Edit from the Utilities menu. Select the font and click on the Edit button to open the Edit Kerning Table dialog box. When you enter VA in the Pair box, the letters will appear in the Preview



Wide Open Spaces In this font, the character pair VA is too widely spaced.



Closing the Gap The Edit Kerning Table utility allows you to alter a pair's spacing. The V and A are now closer together.

window, and the preset kerning amount (if there is one) will appear in the Value box. As you change the kerning value, the letters will move in the Preview window (see "Closing the Gap").

Once the letter spacing is as you want it, click on Replace and then on OK. This creates a new kerning pair for this letter combination. Note that these kerning changes will apply only to the capitalized VA letter combination—not to Va or va. Click on Save in the Kerning Table Edit dialog box to make the changes part of your XPress Preferences file. This kerning pair will apply to all of your future XPress documents (when you open a previously created document, you can opt to apply the new kerning preference or to disregard it from now on).

Big Changes for Small Caps

In text that contains many acronyms, using small caps can be less distracting to the eye than full caps. Some typefaces include their own style for small caps,

specifically designed to harmonize with the color, weight, and proportion of full caps. Using these true small caps will yield visibly more-attractive text than you'll get from the "artificial" ones created on-the-fly by QuarkXPress.

However, when you *must* use a font without its own small caps, you can at least make the small-cap impostors look more convincing. To make small caps, QuarkXPress reduces letters to 75 percent of the font's vertical point size and character width. As a result, the small caps for a font with an unusually large or small x-height (which is determined by the size of a font's lowercase letters) can look proportionally too small or large.

To fine-tune Quark's automatically generated small caps, open the Edit menu's Preferences submenu and select Document (⌘-Y). In the Document Preferences window, click on the Character tab and enter a new percentage in the Small Caps VScale and HScale fields. Click on OK to view the results in your document. Depending on your font's x-height and stroke weight, you may prefer lower or higher percentages. Note that this process affects all small caps in a document, not just those of a single typeface.

Looking Good

Bad typography may not be as glaring as an awkward layout or an inappropriate color, but it does make a difference in your work's overall success. And in today's dicey economy, none of us can afford to ignore that. **m**

Senior Features Editor TERRI STONE covers publishing and typography. She can be reached at tstone@macworld.com.

Web Publishing Secrets

So you want to add animation to your Web site, but you *don't* want the hassle of switching between several programs. No problem. Thanks to Macromedia Dreamweaver 4's Timelines panel, you can easily create eye-catching animations without ever leaving your trusty page editor. Here's a guide to getting started with the Timelines panel, as well as tips on avoiding some common traps.

Animation Secrets

The Timelines panel in Dreamweaver 4 (\$299; 800/457-1774, www.macromedia.com) lets you view any incarnation of your Web page as its animation progresses over time. Each stage is called a *frame* and is represented by small squares in the timeline's animation channels (see "Meet the Timeline"). The current animation is represented by a solid blue line that begins and ends with hollow circles, which represent *keyframes*—frames that define the motion of an animated layer.

Dreamweaver can animate only CSS layers, so before you add motion to an element on your page—whether it's text or a graphic—you must first place it in a layer. To move a layer across the screen, you need only tell Dreamweaver where on screen you want it to start (using the first keyframe) and where you want it to end (using the last keyframe). Let's say you want your company logo to fly across your page, sweeping past text and other graphics. First select the layer you wish to animate. Then open the Modify menu and choose Add Object To Timeline from the Timeline submenu; Dreamweaver adds a 15-frame animation layer, with keyframes at the beginning and end, to the panel's timeline. Finally, click on the last keyframe and drag the layer to the end point of your animation. Dreamweaver automatically generates all of the animation's intermediary steps. You can add additional keyframes by ⌘-clicking on a frame inside the animation and repositioning the layer at that point.

Keep in mind that these layer-based animations can be viewed only in Web browsers that support Dynamic



HTML (DHTML). This includes versions 4.0 and higher of both Microsoft Internet Explorer (IE) and Netscape Navigator.

Get Moving Although you've created a timeline, your animation will not instantly begin playing after your page loads. For that to happen, you need to trigger the animation by selecting the Autoplay option in the Timelines panel. Alternatively, if you want your animation to start only after some other action occurs (for example, after a user clicks on a Play button), you can apply Dream-

weaver's Play Timeline behavior to an object.

Setting It Straight Due to a quirk in Dreamweaver, whenever you have more than two keyframes in one animation bar, Dreamweaver curves the animation's path. This is great if you want your layer to arc gracefully across the page (simply add an additional keyframe between the first and last frames of the animation and reposition the layer to the top of the arc). But if you want your animation to move in a series of straight lines (in a zigzag pattern, for example), you'll have to work around this problem by breaking it into a series of two-frame animations—one for each straight segment of the motion.

Sized to Fit The Mac version of IE 5 sometimes creates strange trails across the screen when animating a layer. This happens when the object—usually a graphic—inside the layer is larger than the layer itself (for example, if you draw a 50-by-100-pixel layer and insert a 100-by-200-pixel graphic). To avoid this problem, go to the Property Inspector and size your layers to either match or exceed the dimensions of their respective objects. It's best

to do this *before* you animate the layer; otherwise you'll need to resize the layer at *each* keyframe in the timeline.

Creating an Automated Slide Show

There's more to Dreamweaver's timeline than flying animations. Imagine snapshots of your Web-design portfolio appearing one after another on a potential client's screen, or a rotating ad banner you can use to advertise three products in one space. The Timelines panel lets you create these and other time-based effects. And by using a timeline, rather than an animated GIF, you can quickly make changes—adding and deleting images, for example—without having to switch to your graphics program.

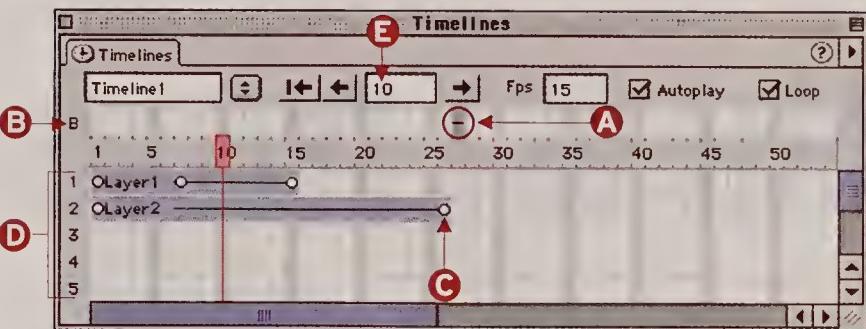
To get started on your automated slide show, select an image and add it to the timeline (using the Modify menu's Timeline submenu). As with a layer, Dreamweaver adds 15 frames to the timeline, including beginning and ending keyframes. Next, click on the last keyframe and change the image's Src property in the Property Inspector. (It's important to make sure all the images in your slide show have the same dimensions. If they don't, the Web browser will distort them so they all fit within the same area on the page.) Now when the timeline plays, the image you placed first on the page will, after 14 frames, be replaced with the second image. To continually repeat your slide show, just select the Loop option in the Timelines panel.

Managing Your Time To keep your timeline manageable when creating a slide show, restrict the Fps (frames per second) setting so that only one frame appears every second. (By default, Dreamweaver's Fps setting is 15.) This way, if you want a new image to appear every five seconds, you must add a keyframe only every six frames instead of every 76 frames.

Expanding Your Slide Show You can add as many images to the slide show as you want simply by inserting additional keyframes into the timeline and changing the image's Src property at each keyframe. But keep in mind that you can't add keyframes at the *end* of an animation channel; therefore, it's best to set the duration of the entire slide show when you first begin. To do this, grab the last keyframe and drag it to the frame where you want your slide show to end. For example, say you want a slide show to display five images, one every five seconds. If you set the Fps to 1, you simply move the last keyframe to frame 25 in the timeline and then add additional keyframes at frames 6, 11, 16, and 21.

Timing Behaviors

Dreamweaver can apply time-based controls to behaviors as well as to images. For instance, you might want to use the Go To URL behavior to jump to another page after a layer finishes its animation. The Timelines panel's often-overlooked Behavior channel lets you specify when the action should take place. In fact, you can use this feature without adding a layer or image to the timeline.



Meet the Timeline Dreamweaver's Timelines panel lets you create animations by adding behaviors **A** to the Panel's Behavior channel **B** or adding keyframes **C** to its Animation channel **D**. The currently viewed frame is listed in the Frame box **E**.

Creating Rotating Text If you've visited the search engine Ask Jeeves (www.ask.com), you've probably noticed the rotating Tips list below its search box. Using the Timelines panel's Behavior channel, you can quickly create the same effect—for example, you can display short news clips that change every few seconds on your company's home page.

To get started, draw a layer on your Web page and type in the first item you want displayed. Open the Timelines panel and click on the desired spot in the Behavior channel, which is located just above the frame numbers and marked by the letter *B*. The frame you select determines how long the first message is displayed before it's replaced by the next. Then open the Behaviors panel from the Windows menu and select the Set Text Of Layer behavior. In the resulting dialog box, choose the layer that contains your rotating message, and then type in the next segment of text. You can continue this way, adding more Set Text Of Layer behaviors along the timeline. To finish, select the Timelines panel's Autoplay and Loop options. Now, after your page loads, your rotating messages will run continuously.

Strange Behavior There's one thing to watch for when using the Behavior channel, however. After you've added your behavior to a frame, the Behavior panel has a tendency to get stuck. In these cases, when you click on other HTML objects on the page—such as a link or the **body** tag—the Behavior panel still displays the behavior you just applied to the timeline. If you then try to add a new behavior to the selected HTML, Dreamweaver actually applies it to the timeline—not the HTML object. To get around this, click on a timeline frame that *doesn't* include a behavior before applying behaviors to other objects on the page.

Looking Good

Getting to know Dreamweaver 4's Timelines panel will not only allow you to enhance the animations on your Web pages, but also enable you to create exciting time-based effects that can enliven your Web site and improve its message. **m**

DAVID SAWYER McFARLAND is the president of Sawyer McFarland Media (www.sawmac.com) and the author of *Dreamweaver 4: The Missing Manual* (Pogue Press/O'Reilly, 2001).

Mac OS X Secrets

AppleScript has experienced some bumps on the road to Mac OS X, but compared with previous OS X incarnations, OS X 10.1 offers greatly improved AppleScript implementation. If you're invested in AppleScript and you're making the transition to OS X, you should know what changes you can expect, what problems may occur, and what new scripting tools the new Mac OS provides.

A Strange New Land

Many of the changes you must adjust to with AppleScript in OS X 10.1 stem from OS X's Unix underpinnings. The file system has significantly changed, affecting which files you can read, what you can alter, which folders AppleScript considers special, and where certain key AppleScript components, such as scripting additions, live.

Other changes are the result of the differences between the new user interface and the old one. For example, folders have a Column view, and OS 9's Button view no longer exists. Scripts that make heavy use of the Finder may well need updating in OS X (and any script that uses folder actions is dead in the water), although many scripts for third-party applications may work with little or no modification (for example, a Eudora script may require only a simple recompile).

One of the most radical changes you can expect is that now not one, not two, but *three* different scripting environments coexist on the Mac: scripts can run natively in OS X, in OS X's Classic mode, or in OS 9. There are some differences, but seasoned scripters should be able to sort them out easily. To your advantage, scripts running in OS X can reach through and control applications running in Classic mode, and vice versa—good news if you depend on AppleScript and are still tied to Classic mode-only apps.

Familiar Territory

It won't be difficult to get used to the latest version of Apple's Script Editor. It has had an Aqua face-lift, but it



hasn't changed much from the bare-bones tool it's always been, with one significant exception: when you save scripts as apps, you no longer need to check a system-compatibility box. Instead, you save scripts in a universal format that will run in OS 9, OS X's Classic mode, or natively in OS X. You'll still need to test each script to ensure that its commands work in the target environment.

Script Editor was the first Carbonized application, but strangely, it doesn't support *sheets* (Save dialog boxes attached to the script window). In OS X 10.1, it once again supports recording for any recordable applications.

Confounded in the Finder In OS 9 and earlier, using the record function in Script Editor was a handy way to learn or refresh your understanding of the AppleScript syntax for most Finder operations—you performed the actions, Script Editor wrote the code, and you could study the code. Early versions of OS X had a recordable Finder, but it was broken in a number of ways. The Finder is no longer recordable in OS X 10.1. While that may not be a problem for seasoned scripters, it's a definite impediment for new scripters. Fortunately, you can still boot into OS 9 and record scripts there until you get comfortable with the language.

Changes for Scripting Additions

One of AppleScript's strengths has always been that developers could extend the language and add powerful new commands in the form of scripting additions. Developers have written an overwhelming number of scripting additions for

the classic Mac OS, and some have become must-have tools for serious scripters (you'll find the majority of them at www.osaxen.com).

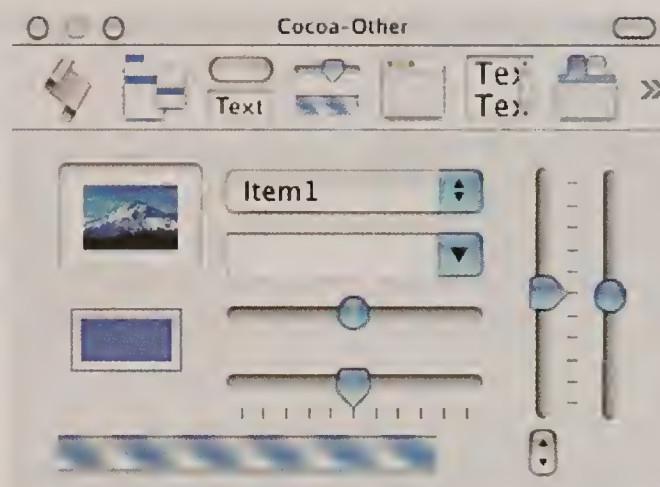
Unfortunately, none of those scripting additions work natively in OS X. You can use them in the classic OS, though coaxing them into action requires some extra steps. If your script addresses applications and scripting additions only in OS X's Classic mode, then save the script as an application, click on its icon in the Finder to highlight it, and choose Show Info from the File menu (⌘-I). Finally, select the Open In The Classic Environment option, and your scripting additions should work fine. If your script addresses items in OS X and classic-OS scripting additions, the process is more involved. You must follow an unconventional procedure, and—depending on the size and complexity of the script—it could be an easy task or a time-consuming one. For details on the procedure, see the Limitations section in Bill Cheeseman's report on AppleScript 1.7 (www.applescriptsourcebook.com).

In Mac OS X, you may find OS X-native scripting additions in any of three different locations. The standard additions are in the Scripting Additions folder (System: Library) of the start-up disk. You can add another Scripting Additions folder to the Library folder at the root level of the hard drive to hold more scripting additions. Anyone, whether logged in as user, admin, or root, can access scripting additions in either of these locations. If you want to make some scripting additions available to only one user, you can do so by making and populating a Scripting Additions folder in the Library folder of that user's Home folder.

Because few scripting additions have been developed for OS X, scripters who rely heavily on additions may be forced either to continue using OS 9 or to rework their scripts in OS X to gain access to the scripting additions' commands in Mac OS X's Classic mode. If you have a lot of scripts to convert, that could end up being very time-consuming.

Built-in Script Launching

OS X comes with its own script launcher—cron, a Unix *daemon* (a process that runs in the background, executing scheduled commands) that you can use to schedule the running of scripts, including AppleScripts, Perl scripts, and shell scripts. If you don't like the idea of learning to set up automated script-running from the command line, you have a couple of alternatives. The freeware CronniX, by Sven Schmidt (www.koch-schmidt.de/cronnix/), puts a user interface on the cron daemon and can schedule any process, not just AppleScripts. Script Timer, by Donald Hall (\$7; www.theboss.net/appsmore/), can schedule the launch of any OSA script.



Interface Time AppleScript Studio's tools include this palette of widgets for customizing a script's front end.

More Power to You

Perhaps one of the more exciting aspects of scripting under OS X is that you can run your scripts from the Unix command line. Access the command line in the Terminal application, and in OS X 10.1, Terminal itself is scriptable. Through the scriptable Terminal window you can make your AppleScripts run scripts, including other AppleScripts, Perl scripts, and shell scripts.

New Protocols Another impressive AppleScript change in

OS X 10.1 is support for XML-RPC (Extensible Markup Language—Remote Procedure Call) and SOAP (Simple Object Access Protocol)—protocols that let XML and SOAP servers (similar to Web servers for HTTP) answer requests for objects (snippets of data such as word definitions, stock quotes, and currency-exchange rates) and return them blazingly fast, right to your script.

These services are in the pioneer phase, but hundreds are already available. Check out www.xmethods.com for an extensive list. With the information there, you can rework the two sample scripts—"Stock Quote" and "Current Temperature by Zip Code"—that come in the standard OS X installation, and take advantage of these services now.

New Development Tools A pleasant surprise with the release of OS X 10.1 is the announcement of AppleScript Studio, a set of free development tools for scripters that includes interface-building, debugging, and source-control components. With AppleScript Studio, every scripter will be able to make professional-looking front ends for their scripts.

AppleScript Studio had not been released at press time, but it should be available when you read this. Check any Mac news site for an update or go to www.macscripster.net.

Prime Time for Scripting?

Mac OS X 10.1 has brought some enticing additions to AppleScript. For experienced scripters, it's a good time to get the lay of the land. There are still gaps, but support is maturing faster than expected. Given the Unix heart of OS X, the absence of multithreading in AppleScript is a disappointment, but on the plus side, Unicode support is now mostly complete. Those who depend on AppleScript for automated workflow may not yet be able to move entirely to OS X, but it's time to start preparing.

Apple has shown its commitment to AppleScript. If developers continue to improve their support in the OS X versions of their applications, scripters have a very bright future on the Mac. **m**

BILL BRIGGS wrote MacCentral.com's AppleScript Primer. He teaches in the Department of Electrical and Computer Engineering at the University of New Brunswick.

Mac 911

A crew of curious questioners petition *Mac 911* for help with hard-to-read keyboards, missing thumbnail images, monitors that appear to lack compatible connectors, and laser printers in an AirPort network. I toss in a helpful tidbit about performing a custom installation with Apple's Software Restore CDs, and a reader explains how to create a bootable disc under Mac OS X.

Sight for Sore Eyes

Q. I'm a senior citizen who loves her iMac, but the dark keyboard with slim white lettering is difficult to read for those of us with vision problems. Is there a more user-friendly, Mac-compatible keyboard available?

DOROTHY L. STEUSSY
New Braunfels, Texas

A. Although the Apple Pro Keyboard and the Lilliputian keyboards bundled with the blue-and-white Power Mac G3, early iMacs, and Power Mac G4s are stylish input devices, that thin white type on dark keys can make the key characters devilishly difficult to discern. Thankfully, you have a couple of options.

Let's start with a terrific low-tech (as well as low-cost) solution. ASF Lightware Solutions offers Keyboard Vision Aids (800/771-3600, www.keyboardvision.com), a package of stickers that you attach to the keys on your keyboard. These stickers have large characters (over a quarter-inch tall) in four color patterns—black letters on a white background, black on gray, yellow on black, and white on black. The collection of stickers includes characters for both Mac and PC keyboards and costs all of \$12.

You might also consider getting a new keyboard. A number of Mac-compatible third-party keyboards are available from companies such as Adesso (310/645-3746, www.adessoinc.com), Macally (626/338-8787, www.macally.com), MacSense (408/844-0320, www.xsense.com), and Microsoft (425/882-8080, www.mactopia.com). However, not every keyboard will meet all of your requirements.



Some of these keyboards mimic current Apple designs—complete with lettering on translucent keys—and a few feel shoddily made. Of the third-party keyboards I've tried, I prefer Microsoft's Internet Keyboard Pro. It features black letters on whitish keys, has an acceptably responsive feel, and includes a collection of helpful buttons that allow you to control the functions of AppleCD Audio Player, adjust the Mac's volume, and trigger common browser commands (including Back, Forward, Stop, and Refresh). If these

features don't wow you, the price may. Microsoft asks only \$40 for the keyboard (with an additional \$10 rebate in effect until January 31, 2002), while Apple's Apple Pro Keyboard costs \$60.

Microsoft's keyboard isn't without fault. It's quite bulky, and because it was designed with Windows users in mind, you won't find any ⌘ or option keys. (However, the included Mac software automatically maps the keyboard so that the keys on either side of the spacebar are the ⌘ keys, and the keys next to them are the option keys. But as of this printing, the included software is not Mac OS X compatible.)

If the idea of skin-to-plastic contact with a Microsoft product gives you a bad case of the jimmjams, scour around in the attic (or at a local garage sale) for an old Apple Extended Keyboard II. With this keyboard and Griffin Technology's \$39 iMate ADB adapter (615/399-7000, www.griffintechnology.com), you can type away, secure in the knowledge that you're using the finest (and one of the

most legible) input devices ever made. And yes, these old Apple keyboards work with Griffin's OS X beta drivers.

All Thumbnails

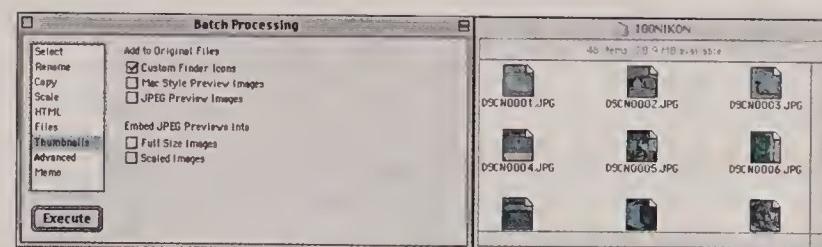
Q. When I attach my digital camera's media-card reader to my Macintosh, I see only generic QuickTime JPEG icons. Is there a way to preview the images on my media card without opening them all in PictureViewer?

SUDIPTO GHATAK

Singapore

A. The software that ships with digital cameras often includes a feature that allows you to view your pictures as thumbnails when you plug either the camera or the camera's media card into your Mac. The Nikon View software bundled with my CoolPix 950, for example, provides this capability. If your camera doesn't ship with such software, or if you find that software unreliable, you have other options.

In Mac OS 9.2 and earlier, one of those options is Juri Munkki's \$15 shareware utility Cameraid (www.cameraid.com). This extremely useful tool allows you to create thumbnails on your digital camera's memory card. To do so, drag and drop your memory card's icon on the Cameraid icon and select Add Finder Icons from Cameraid's Shortcuts menu. When you go back to the Finder and open your memory card, you'll see thumbnail



I'm All Thumbnails Cameraid can create thumbnail images that reside on your digital camera's memory card.

images for all the pictures on the card (see "I'm All Thumbnails"). Note that you have to repeat this procedure if you add more pictures to the card.

Mac OS X offers Image Capture, a utility that automatically downloads pictures from supported digital cameras and media readers. Although Image Capture can't create thumbnails on media cards, it can automatically create Web pages that contain images pulled from your camera or media card. For a list of cameras and media readers compatible with Image Capture, visit www.apple.com/macosx/whatyoucando/applications/imagecapture.html.

Limited by LCDs

Q. I have an older Power Mac G4—the AGP graphics model that lacks an Apple Display Connector (ADC). I'd like to purchase one of the new Apple monitors, but they don't work with my Mac. What can I do?

TIM CAIN

Rochester, New York

A. Next time you wander past an Apple store, you might sidle up to the Genius Bar and humbly ask, "Who's the genius who decided to equip Apple monitors with a proprietary connector that makes them incompatible with nearly every computer on the planet?" After being politely but firmly escorted to the door, none the wiser, you might consider one of the following two options: buying an adapter or buying a monitor manufactured by a company other than Apple.

"Tis too true that the ADC found on Apple's flat-panel displays is compatible only with those Power Mac G4s manufactured since July 2000. Fret not, however; there is hope. If you have a Power Mac G4 (AGP) with a DVI video connector—a longish video connector, not the stubbier VGA connector also found on these Macs—you can use a new Apple monitor, with the help of Dr. Bott's DVIator (503/582-9944, www.drbott.com). This \$150 adapter lets you use any of the new Apple monitors with a Mac that bears a DVI connector.

And because the DVIator supports any Mac with a DVI connector, those of you with PCI Macs can use a modern Apple monitor with the help of a third-party video card, such as ATI's \$230 Radeon Mac Edition (905/882-2600, www.atitech.com), that carries such a DVI connector. With the card in place, attach a DVIator and then string the adapter to an Apple monitor.

continues

Tip of the Month

In Mac OS X 10.1, you can create a bootable disc—one that boots into Mac OS 9—with Apple's Disc Burner. Here's how:

Running OS X 10.1, insert a bootable CD—your Mac's Software Install CD, for example—and launch Disk Copy (Applications: Utilities). Choose New Image From Device from the Image menu, and in the resulting dialog box, select your CD-ROM drive. Click on the Image button.

You'll be asked to specify a location for the image, as well as a format. Place the image wherever you like and choose CD/DVD Master in the Format pop-up menu. Make sure None is selected in the Encryption pop-up menu. Click on the Image button.

When Disk Copy finishes creating the image, choose Mount Image from Disk Copy's File menu. Once the image is mounted, you can modify it any way you like (by adding troubleshooting utilities, for example). When you've finished modifying your disk, remove the image by dragging it to the trash, and then select Burn Image from the Image menu. Select the image file you created and click on Burn to create your bootable disc.

BLAKE HODGETTS

Santa Monica, California

But let's pause a minute to do the math: \$150 for a DVIator, \$230 for an ATI Radeon card, and \$600 for an Apple Studio Display (15-inch flat panel). *¡Qué lástima!* Add tax, license, and dock fees, and we're talking well over a thousand bucks for the pleasure of adding a 15-inch flat-panel monitor to a PCI Mac.

If I absolutely had to have an LCD monitor, I'd eyeball a third-party model that included a DVI connector. Macworld Labs recently recommended the MultiSync LCD1525X, from NEC-Mitsubishi (888/632-6487, www.necmitsubishi.com), a \$650 15-inch display for those whose Macs don't sport the ADC. (Read the review at www.macworld.com/2001/07/17/reviews/lcds.html.) And although I haven't had the opportunity to sit down with one for any extended period of time, Formac's 17-inch gallery 1740 (877/436-7622, www.formac.com) looks darned tempting. Like the Apple LCD displays, it bears an ADC connector, but Formac plans to offer its ADC to DVI adapter for a mere \$50. And get this: at \$899, the gallery 1740 lists for \$100 less than Apple's 17-inch display.

Wireless Words

Q. I'm using an AirPort Base Station to connect wirelessly to the Web via a DSL connection. I'd like to print remotely as well. Is there a way to incorporate my LaserWriter into my wireless network?

DAVID WESTIS
Richmond, Virginia

A. *Mais, oui!* For the sake of argument, we'll assume that this LaserWriter is compatible with LocalTalk—

Unsolicited Advice

Apple generously bundles such terrific applications as iMovie 2 and iTunes 2 with new Macs. Unfortunately, the company packs these applications on one or more Software Restore discs, which provide no way to easily install individual applications. Instead, you have to install everything—and in some cases, erase the contents of your hard drive—unless, of course, you know the following trick:

Clear 2GB of hard-disk space and create a new folder. Into this folder, copy the disk-image files from each of the Software Restore discs that came with your Mac (these files may be contained in a Configurations folder).

Launch the Disk Copy application and drag the first disk-image file (it will be named something like "Power Mac HD Disc 1.dmg") into the Disk Copy window. When you do this, a disk image appears on your desktop. That disk image contains the software that originally shipped with your Mac.

To install an application, just drag the software you want from the disk image to your hard drive.

as are all but a few LaserWriters. To make the connection, you will need an Ethernet hub and an Ethernet-to-LocalTalk adapter. Ethernet hubs cost less than \$50, and an Ethernet-to-LocalTalk adapter, such as one of those available from Proxim (800/229-1630, www.proxim.com) or Asante (408/435-8388, www.asante.com), costs less than \$100.

Try the following (with your Mac switched off): Using standard straight-thru Ethernet cables, attach the AirPort Base Station and the DSL modem to the Ethernet hub (use the standard Ethernet ports, not the hub's Uplink port). Then run another Ethernet cable from the hub to the Ethernet-to-LocalTalk adapter, and string a LocalTalk printer cable between the Ethernet-to-LocalTalk adapter and your LaserWriter.

Fire up your Mac and launch the AirPort Admin Utility. After you've logged in, click on the Network tab in the Configure Base Station window and select the Enable AirPort To Ethernet Bridging option. Switching this option on allows the computers on the AirPort network to access the Macs and printers connected via Ethernet. Now click on Update and quit the AirPort Admin Utility.

You should now have access to your printer in Mac OS 9.2 and earlier, and in Mac OS X. To print from the printer in OS 9.2 and earlier, open the Chooser and click on the LaserWriter 8 option; your printer should appear in the right-hand portion of the Chooser window. Click on the printer's icon, and then click on the Setup button to configure the printer.

In Mac OS X, open the Network system preference, select AirPort from the Show pop-up menu, click on the AppleTalk tab, and select the Make AppleTalk Active option. Then you must click on the Apply Now button to save your settings.

Open the Utilities folder inside the Applications folder, launch the Print Center application, click on Add Printer, and select AppleTalk from the Printer List pop-up menu. If OS X supports your printer, its name should appear in the pane below in short order. Click on Add to place your printer in the list of available printers; then quit Print Center. Your printer is now available to your AirPort-equipped Mac. **m**

Contributing Editor CHRISTOPHER BREEN had the wherewithal to write *Mac 911* (Peachpit Press, 2002), an upcoming troubleshooting guide fit for the whole family.

Share tips and discuss Mac problems with other Mac users in the Mac 911 forum (www.macworld.com/subject/mac911). Also send tips and questions by e-mail to mac911@macworld.com. *Macworld* pays \$50 for tips selected for publication in *Macworld*. All published submissions become the sole property of *Macworld*.

Shareware and freeware mentioned in *Mac 911* are available from ZDNet's Macdownload.com (www.macdownload.com).

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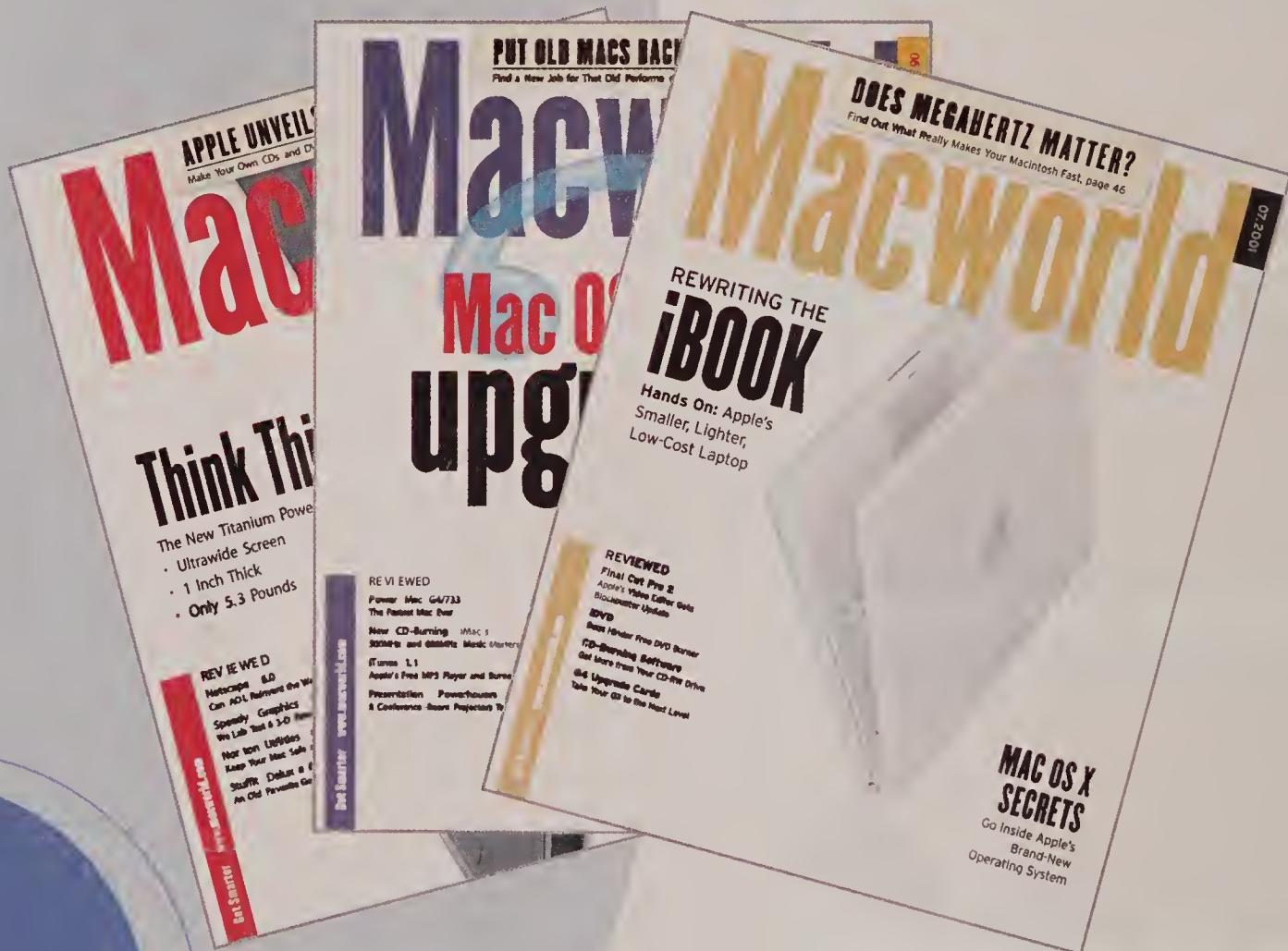
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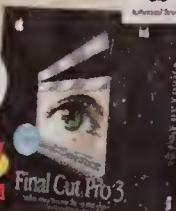
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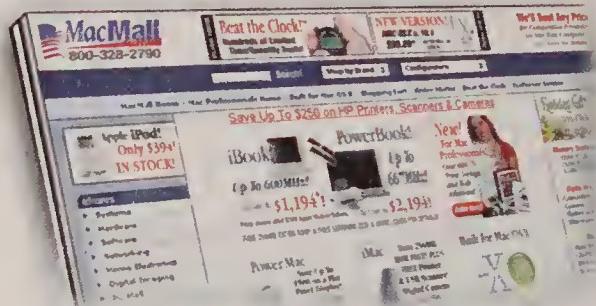
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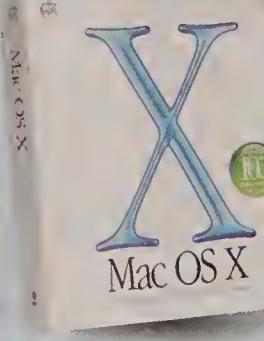
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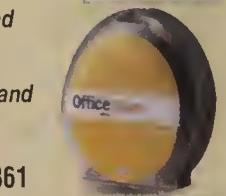
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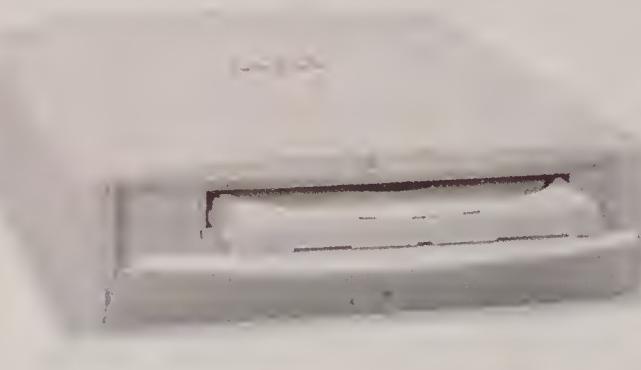
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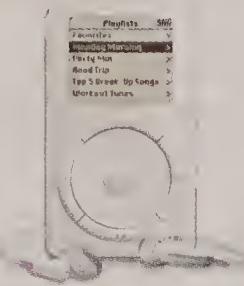
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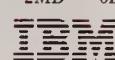
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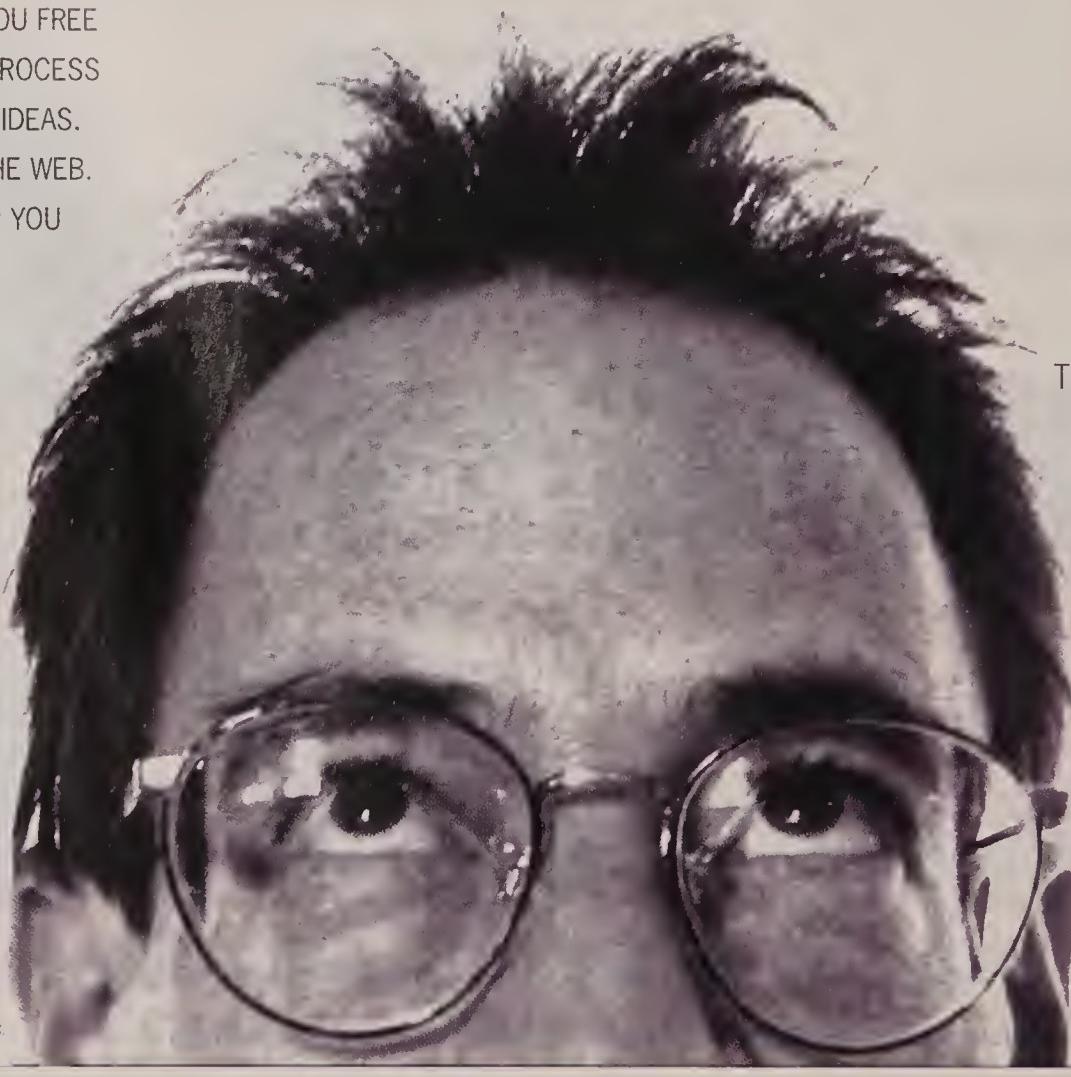
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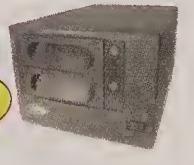
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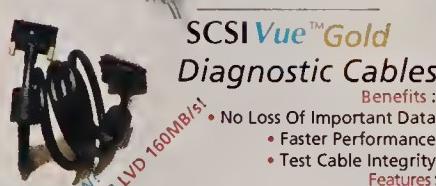
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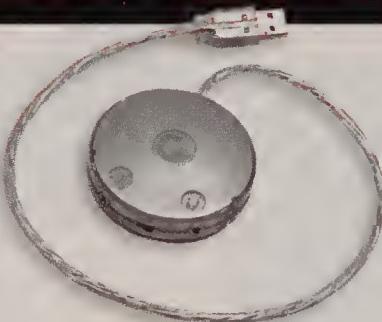
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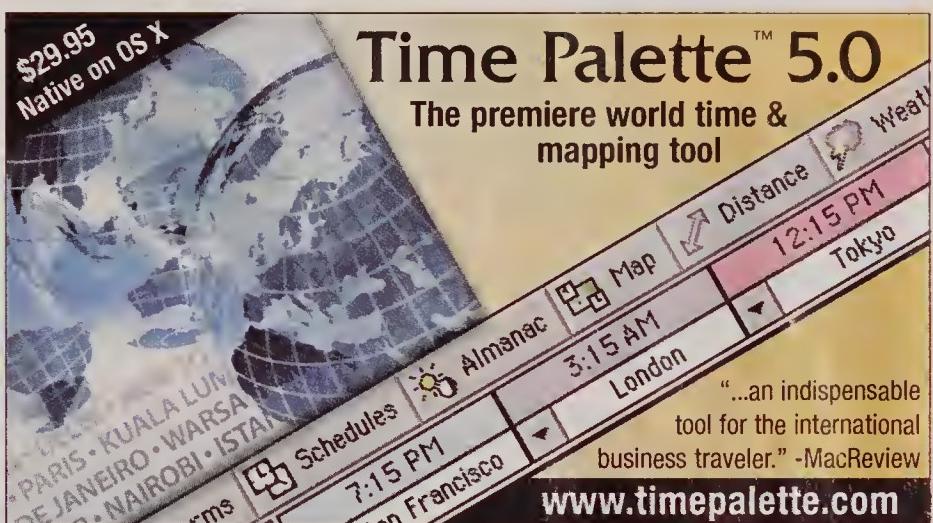
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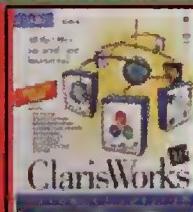
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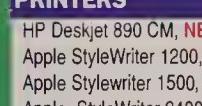
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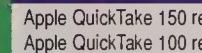
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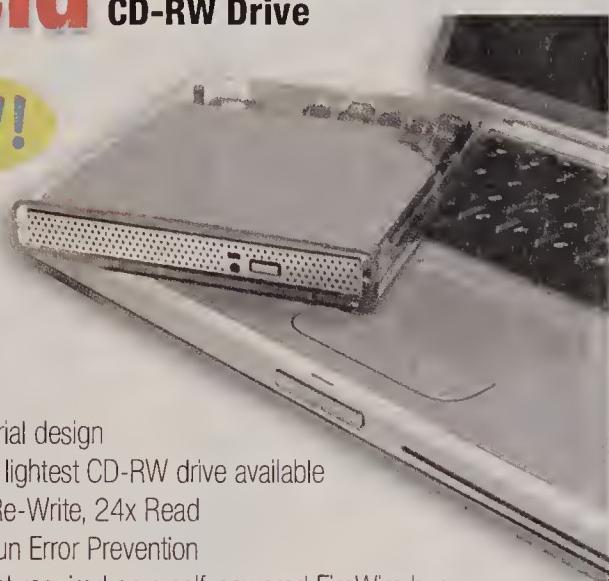


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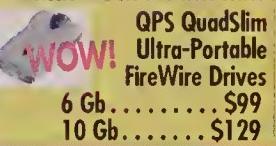
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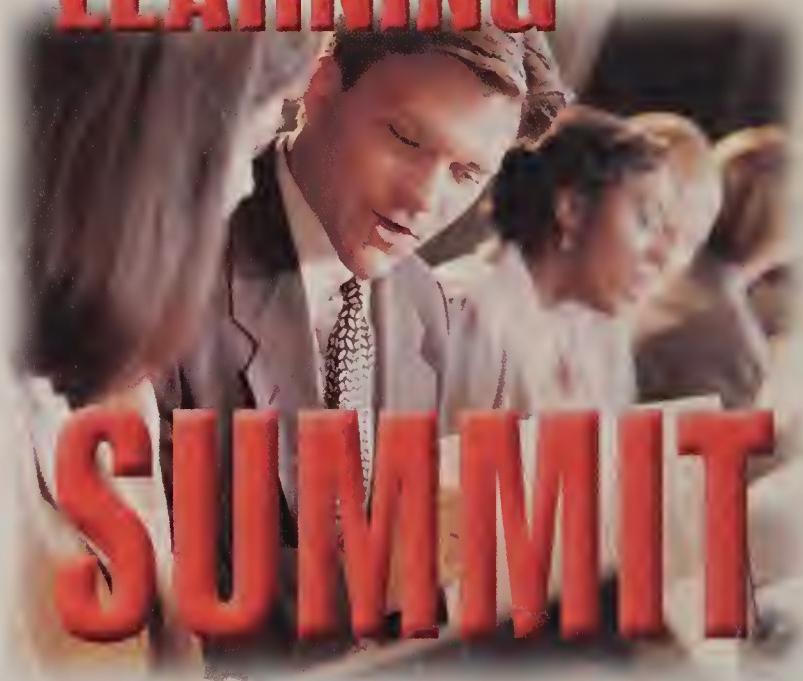
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panies'. Like the best of Apple's wares, the iPod makes you think about not what it does but what you can do with it.

What's in a Name?

Still, the iPod is an enticingly odd beastie. During my Apple briefing, I was initially confused about what this thing actually did. The name is generic. Nothing on its face has the familiar layout of an audio player, and only a close examination reveals that three of those arc-shaped buttons have playback symbols faintly silk-screened on them. Lying inert on the table, it could have been anything.

As I lean back on my sofa with my iPod and let the trance-inducing opening strains of Spiritualized's *Pure Phase* wash over me, I find my mind wandering and speculating. Is the iPod in fact a far more forward-looking device than I suspect? Think about this device in the abstract. It's not a conventional MP3 player. It is, in fact, a pocket-size FireWire hard drive, with built-in software for independently playing limited types of media and a rudimentary GUI that lets you navigate quickly through hundreds and thousands of files.

What if the iPod's destiny were to be a media viewer, as opposed to a music machine? I can fit a whole episode of *Babylon 5* into a nearly VHS-quality 500MB QuickTime movie. Will the iPod 2 interact with iMovie as easily as the current version does with iTunes?

Will the iPod 3 have QuickTime and MacLink translators, for reading any document and viewing any picture that has the right file type? What if it has a simple piece of code that lets you scroll through lists of contacts and appointments synced from Palm Desktop?

By the time I'm into Track 6, I'm wondering what would happen if the iPod 4 shipped with a software-development kit—which means that I should hit the Menu button and scroll down to the *Monty Python and the Holy Grail* soundtrack to slap myself back into relative reality.

The next generation of truly revolutionary devices won't be computers or PDAs. They'll be innocuous little doodads that look and operate nothing like "real" computers and are as intimidating to the average human as a yo-yo (so still intimidating to some). Under the right circumstances and with the right software, the iPod could be such a device.

But the iPod is not the Newton. Unlike the original MessagePad, the iPod is sold by a company that has learned one lesson from bitter experience: while it's important for your technology to stay ahead of your competitors', getting ahead of your customers is death. Man alive, though—as a pocket-size electronic wrapper for toting and accessing desktop media and files, the potential of the iPod is such that one day it could give me and the rest of the world access to things far more ambitious than the audio portion of the "Knights Who Say 'Ni!'" sketch. How Apple is that? **m**

ANDY IHNATKO has been writing about the Mac for over a decade.

WHEN THE FOLKS AT Apple phoned and invited me to a briefing, they promised to show me "a revolutionary, breakthrough new media product"—and those words had the power to get me awake and out of bed at 9 in the morning. They also got me showered and shaved and seated in a downtown conference room by 10:30—an hour clearly fit only for farmers at harvesttime or people being prepped for emergency surgery.

There hadn't been a sound from the two managers and one engineer sitting beside me, but already the trip was worth it. There it sat on the table, beckoning, and such was my excitement at finally being close to learning what this iPod thing was all about that I had some difficulty finding the buttons on its smooth and shiny metal top.

It was heavy, so my first guess was that something so megahyper-superrevolutionary just had to be a working prototype of a *Jetsons*-style flying car; I reckoned that its apparent ability to fold into a wallet-size slab, instead of a briefcase-size one, would prove to be merely the first of Apple's many improvements on the original.

I had no luck at all in getting it to deploy, so I abandoned that tack. I remembered Douglas Adams's final imagining of the reference tool at the center of *The Hitchhiker's Guide to the Galaxy*: a smooth, rounded metal object. While the Apple people exchanged confused looks, I fumbled with the device, looking for seams and joints, and asked it to find me a local dim-sum restaurant.

At this point, one of the engineers snatched it out of my hands and turned it over.

"It's an MP3 player, you idiot!" he hissed, stabbing a finger at the tiny play/pause symbol on one of the buttons while the PR person tried to spin the engineer's outburst into a compliment about my last book.

It was an MP3 player: a breakthrough, revolutionary—um—

ANDY IHNATKO

I Think, Therefore iPod

Is There More to Apple's New MP3 Player Than We Imagine?



MP3 player. My élan was damped. "But I have an MP3 player," I mumbled. "I mean, there are lots and lots and lots and lots of MP3 players out there already."

An awkward pause settled over the room.

Great Expectations

See, when Apple promises to show you something new and innovative, you hope for something like the Newton, an item that overwhelms you with its daring, cunning, and freshness of approach. The iPod is indeed new and innovative, but in a more common, Apple IIc kind of way. It's a conventional device produced by making an unconventional hardware choice and then following the Apple convention of seeing that choice through, with due consideration of all the little implications it will have for the user.

There are already a couple of hard-drive-based portable players on the market, after all; the Nomad Jukebox is the most visible. But previously, these big-assed players were kneecapped by half-assed imple-

mentations. The Nomad is huge (for a portable player), and its USB interface is so slow that by the time you're done copying songs to its hard drive, half the bands you're listening to have moved from MTV's *Total Request Live* to VH1's *Where Are They Now?*

And anyone who has contemplated the wide gulf between Anka, Paul, and Zappa, Frank, won't know the half of it until they try to use only a small set of buttons to navigate from one to the other through a long list.

Implications ought to inform implementations: that's the difference between clever and stupid, and it's the difference between a mega MP3 player that's a freak product and one that's a credible mainstream choice. It's also, but not always, the difference between Apple's products and other com-

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